Responses to Cobol-80 Overwhelmingly Negative

By Lois Paul
CW Staff

HARTFORD, Conn. — Fewer than a dozen of the more than 2,200 responses to the American National Standards Institute X3J4 subcommittee have been in favor of its proposed Cobol-80 standard.

Representatives of about half the Fortune 500 companies were among the respondents, and about 30% of the 2,200 responses included detailed analyses of the cost of converting to Cobol-80, according to Joseph T. Brophy, senior vice-president of Travelers Insurance Co. here and a member of the Ansi X3 Committee for Information Systems.

Brophy said that his own analysis of the responses revealed that it would cost at least 50 cents per line of code to convert to the new standard, depending on each company's situation and the costs included in the evaluations they sent to the X3J4 subcommittee.

The four-month public review period for the Cobol-80 standard ended Feb. 13, but responses are still coming in. Brophy said that the overwhelming majority is very strongly against the proposed standard because of its incompatibility with the 1974 version of Cobol.

Seventy percent of the responses were general statements that indicated a particular firm was against the standard and that the standard should be upward-compatible, Brophy said. "The remainder got into very detailed analysis, the quality of which was really outstanding. Some of the larger companies got into very exhaustive analysis." This included the effect the standard will have on productivity and the cost of conver-

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COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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Wide World Photo

The Boston Ticket Party

Angered by the computerized collection of parking ticket fines, these 400 Boston protesters, led by local radio personality Jerry Williams (left), recently dumped copies of parking tickets into the garbage. Story on Page 6.

IBM Yields to Adapso Heat, Unbundles SSX Programs

By Marcia Blumenthal
CW Staff

RYE, N.Y. — Capitulating to pressure from a major industry trade association, IBM will start offering users this month the option of separately purchasing the 14 Program Products formerly bundled within the Small System Executive/VSE (SSX/VSE) operating system for its 4321 system, introduced last November.

In a recent letter to an executive of the Association of Data Processing Service Organizations, Inc., IBM also said it intends to market and support its full DOS/VSE software product line on the 4321. IBM told Adapso that it would formally make this announcement to users to coincide with the availability of the 4321, which is slated for delivery this month.

The 4321 is essentially a preconfigured, pregenerated system geared for an "operatorless distributed" environment, according to IBM. When the 4321 — a replacement for the IBM 4331 Group 1 processor — and its SSX operating system were announced, it appeared that a user had to buy SSX/VSE and the program products as a unit, according to Mar-

(Continued on Page 2)

DDP System by Harris Ties to Variety of CPUs

By Tom Heukel
CW Staff

DALLAS — Harris Corp. unveiled a distributed processing system last week designed to interface with mainframes from IBM, Burroughs Corp., Sperry Univac, Control Data Corp. and Honeywell, Inc.

According to Harris, its Multifunctional Integrated Design (Mind) system is aimed at IBM's 8100 market and distributed processors offered by Four-Phase Systems, Inc.

The Mind system employs a trilevel architecture that uses a host processor, two specialized internal processors and up to 60 intelligent microprocessor-based terminals. The system reportedly removes the burden of processing from the host system and redistributes it to the terminals.

This redistribution allows users to perform concurrently source and format data entry, local and remote interactive operations, interactive Cobol and word processing applications, Harris said.

The Mind system employs two internal processors. One is a central shared-resource processor based on Harris 1600 series processors that handles files and allocates system resources. It also can be used for data entry and remote job entry.

The other processor, a central interactive processor, is based on Harris' 9200 line of processors. It functions as a front end to handle communications to a host processor, Harris said.

Each of the two processors is dedicated to a specific function and cannot operate interchangeably, a

(Continued on Page 4)

Nixdorf Imports DDP Systems

By Tim Scannell
CW Staff

WALTHAM, Mass. — Nixdorf Computer Corp. has introduced into the U.S. market a series of distributed data-processing systems that support IBM's Systems Network Architecture and are compatible with Nixdorf and IBM host computers.

The 8860 series, unveiled last year in West Germany, consists of the entry-level Model 5, geared for first-time distributed data processing users, and the larger Models 10 and 40. The three systems are field-upgradable and upwardly compatible.

While the smaller Model 5 was designed for use as a single-processor cluster terminal DDP station, the high-end systems can be used as central hosts and compete with machines like the IBM 8100 and Datapoint Corp. DDP systems, a Nixdorf spokesman noted.

The Model 5 has a maximum of 768K bytes of main memory and can support two floppy disk drives. It can handle up to 12 local workstations and one 300 or 600 line/min printer.

The Models 10 and 40 are complete processing systems, each supporting a maximum of 1M byte of main memory and up to 16 and 24 workstations, respectively, the spokesman noted. The Model 10 has up to 156M bytes

(Continued on Page 4)

Poll: Applications Programmer Not an Endangered DP Species

By Bob Johnson
CW New York Bureau

NEW YORK — Despite dire predictions for the future of applications programmers — some going as far as forecasting their demise — an informal survey here found that they are definitely not on the list of endangered DP species.

They are, however, on the list of professionals whose skills will have to change, according to applications programmers themselves.

Gregory Tyson, a programmer at the Equitable Life Assurance Co. here, said that although applications programming is changing, there will always be a need for this type of technician. He explained that one of the biggest fears in applications areas is that companies will purchase packages to handle jobs now performed by applications programmers.

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Charges Poor Management

GAO Assails Treasury's Use of DP

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The U.S. Treasury Department budgeted $641 million in fiscal 1981 for computer equipment, personnel and services to support the work of its 125,000 employees. But the department does a poor job of managing its considerable DP resources, congressional auditors said recently.

"There is more to computer technology than just equipment," the General Accounting Office (GAO) said last month, reporting that it found the Treasury lacked an effective DP planning and policy implementation organization.

"Many Treasury bureaus have incurred unnecessary costs and are not realizing the full potential of automatic data processing," according to the GAO, which gave numerous examples of the department's planning problems:

- The Bureau of Engraving and Printing did not have a long-range strategy to identify and coordinate users' needs. As a result, "systems were initiated and sometimes completed only to be abandoned when it was discovered other requirements had not been considered."
- The U.S. Customs Service, failing to plan for long-term growth, developed a computerized law enforcement system in a nonstandard language that is locked into one manufacturer's equipment and has severe backlog problems.
- At the Bureau of Government Financial Operations, "failure to adequately assess the long-term implications of computer technology has resulted in obsolete, saturated equipment that has increased operating costs, prohibited automation of several functions and seriously jeopardized the accomplishment of its primary mission."

Shared Problems

The department's problems, according to GAO, are the same as those of other federal agencies: lack of top management and user involvement in planning and managing DP resources. The Treasury secretary "has not had an effective, departmental-level means of controlling the large amount of computer resources in the department's bureaus and offices," GAO said, discussing the Treasury's Office of Computer Science.

"Because the Office of Computer Science was not placed high enough in the Treasury's organizational structure, had limited personnel to function properly and had conflicting roles," GAO concluded the department's computer operations have not received "the necessary emphasis and support from the departmental level."

The GAO recommended that the Treasury's top DP executives be given sufficient authority to ensure that the bureaus implement "effective system development procedures" with a formalized planning role for users.

IBM to Unbundle SSX Programs

(Continued from Page 1)

tin Goetz, senior vice-president of Applied Data Research, Inc. and a member of Adapso instrumental in getting IBM to change its policy.

Although IBM offered SSX/VSE as a simplified operating system for the low end of the 4300 line, independent software vendors represented by Adapso were alarmed because the offering smacked of bundling, which is in violation of antitrust regulations, Goetz said.

In several meetings with the trade organization after the 4321 was announced, IBM assured Adapso that users could purchase the Program Products separately if they made a request for a price quotation from the IBM salesman. However, Adapso objected to this practice, noting that it was difficult for IBM customers to determine that these products were, in fact, available separately.

In a widely circulated position paper released last year, Adapso called for IBM to define narrowly and price separately each of its Program Products and services and to price these components the same for all users. Under SSX the full complement of Program Products costs users $1,000; if separately priced, the components would total $1,224, according to Goetz.

Moreover, SSX/VSE as offered did not include other DOS/VSE components, Goetz noted. The currently existing and separately priced DOS/VSE Program Products offered as SSX/VSE include Advanced Functions/VSE, VSE/Power, ACF/Vtame, VSE/Vsam, CICS/DOS/VS, DOS/VS, Sort/Merge, VSE/ICCF, VSE/OCCF, VSE/IPCS, DOS/Cobol, Back Up/Restore, Space Management, VSE/Ditto and the DOS/VSE basic system control program.

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Harris 'Mind' Takes on IBM 8100 Brawn

(Continued from Page 1)

spokesman noted. However, the combined processors can support up to 1M byte of main memory and 768M bytes of disk storage using 12M-, 24M- or 80M-byte Winchester disk drives or 16M-, 32M-, 64M- or 96M-byte fixed/removable cartridge disks.

The Mind system supports large-scale IBM processors including the 370 line, 4300 and 30 series processors. It accepts the 2780, 3780 multi-leaving, 377 series, 3270, 5230 and 3741 emulators, the vendor said.

Burroughs Interface

In addition, the system can interface with any Burroughs processor that can support the firm'a DC 1100 emulator, Honeywell systems that support the G115/355 emulator, CDC systems supporting the 200UT emulator and Univac 9000 series processors, as well as older processors supporting the 1004MTR interface, Harris said.

Mind can interactively communicate with a host processor to retrieve data or update files by emulating an IBM 3270 CRT terminal linked to a host processor through either bisynchronous or Systems Network Architecture communications protocols, Harris said.

Users can perform any system function from a terminal, according to Harris. The terminals, which each offer up to 64K bytes of memory, are capable of displaying 1,290 characters on a 15-in. screen.

For 3270 interactive communications, CRT terminals are available in 960-, 1,920-, 2,560- and 3,440-char. screen sizes.

Harris' line of printers — including dot matrix bidirectional printers (80-, 100- or 180 char./sec) or 45 char./sec daisywheel printers or impact printers — can be used with the Mind system.

The system is upward-compatible with both the Harris 1600 and Harris 9200 series processors. Existing systems can be field upgraded to be incorporated into the Mind system, according to the spokesman.

The Harris Mind System

In addition to the basic Mind hardware, Harris announced two applications packages and a Cobol compiler for the system. The packages are Keyplus, a formatted data entry package, and Wordplus, a word processing package. Interactive Cobol is also available on the system, the vendor said.

All functions, including programming, data entry and word processing, can be carried out at each terminal, the spokesman said. Similar systems from other vendors use dedicated terminals for various functions, he claimed.

The Mind system is also equipped with a Programmable Host Access feature that allows the user to implement upstream 3270 operation. An interactive Map Definition utility can be used as a screen bridge to format design.

In Interactive Cobol, the Harris Interactive Screen Definition utility can be used as a programming tool, the vendor said.

Out in April

The Mind system will be available in April. A five-workstation system, including both processors and all necessary software, costs $80,000. The same configuration leases for $2,000/mo on a five-year plan, the vendor said.

The Keyplus software costs $2,860 for an object license agreement or $50/mo on a five-year plan; Wordplus costs $2,300 for the license or $50/mo on a two-year plan, the vendor said.

The Interactive Cobol compiler can be acquired for a one-time charge of $2,300 or $43/mo on a five-year plan.

Harris' Data Communications Division, which announced the Mind system, is based at 16001 Dallas Parkway, P.O. Box 400010, Dallas, Texas 75240.

Nixdorf Brings DDP Series to U.S. Shores

(Continued from Page 1)

of disk storage, 26M bytes of which is removable. It also supports two diskette drives.

The high-end Model 40 can accommodate up to 312M bytes of disk storage, including Nixdorf's 33M-byte and 66M-byte removable disk products.

Unlike the basic 8860 system, the Models 10 and 40 can also support one 800/1,600 bit/in. tape drive, the spokesman added.

All of the 8860 systems have a machine cycle time of 125 nsec, a read cycle time of 480 nsec and a write cycle time of 350 nsec, the spokesman noted.

According to the vendor, the 8860 series was designed to distribute exact amounts of computing power to distributed locations. Because of each system's architecture, network administrators can either maintain strict central control or offer full user programming capabilities.

For example, while the Model 5 is basically an intelligent terminal system, the Models 10 and 40 can reportedly be outfitted with a full complement of developmental software, based on Ansi 74 Cobol.

'Pipeline Processing'

Like other Nixdorf DDP systems, such as the fully IBM-compatible 8890 information processing system, the 8860 series incorporates a "pipeline processing" architectural concept that relies on dedicated microprocessors to relieve the main processor of certain I/O tasks, the spokesman said.

For instance, each of the 8860 systems has a Programmable Line Controller that manages the SNA data communications functions.

The 8860 machines also have an integrated remote diagnostic capability that allows users to continue using a distributed or central system while checking for system malfunctions, the spokesman explained.

The 8860 differs from the more powerful 8890 systems in a number of respects:

- The 8890 makes greater use of dedicated microprocessors to handle a variety of internal tasks.
- The 8860 incorporates 32K-bit memory chips, rather than the 64K-bit chips used in the 8890.
- Unlike the 8890 systems that can use IBM operating systems software, the 8860 software is based on Nixdorf'a Distributed Information Processing Operating System introduced with the series.

Like IBM'a 8100 distributed processing system, Nixdorf'a 8860 line supports SNA and IBM'a Synchronous Data Link Control networking protocol. The 8860 also supports both 360/- and 370/3770 data communications and 3270-type interactive multiple-display data antry applications, the spokesman said.

Aids Local Users

The 8860 systems were designed to let local users develop their own software applications. All of the machines can use Nixdorf'a Rapid interactive program generator, a menu-driven facility that uses prompts to guide nonprogramming personnel in the creation of software applications.

However, for users who want to retain central control over software, the 8860 offers a central administration system that allows programs to be developed on a Model 10 or 40 machine and downloaded to local 8860 systems, according to the spokesman.

Prices for the 8860 systems range from $31,700 for an antry-level cluster system to $144,850 for an expanded Model 40. Delivery is in 90 days, Nixdorf said from 300 Third Ave., Waltham, Mass. 02154.

Correction

In "ITT 2089 Modem Uses Voice Lines" [CW, Feb. 15], ITT originally reported that its Model 2089 modem costs $5,000. The modem actually costs $7,500, the company said.

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Shut Down by January Raid

Con Claims Success Felled Prison DP Bureau

By Lois Paul
CW Staff

FRAMINGHAM, Mass. — Its very success may have led to the recent shutdown of an inmate-run computer service bureau here.

This is the viewpoint of inmate Richard Quillen, codirector of Con'puter Systems Programming, an inmate employment program that grew out of a nationally acclaimed computer training program for inmates of Massachusetts state prisons.

Both the service bureau and the training program have been closed since a Jan. 6 raid by state and local police on the Massachusetts Correctional Institution (MCI) here [CW, Jan. 11]. The police acted on suspicions that inmates were using the prison computer system for narcotics and gaming activities, but Quillen recently claimed that the raid's real intent was to shut down the service bureau.

Tax Evasion Indictments

No charges have yet been formally filed against Quillen and four other inmates involved with Con'puter, but indictments on charges of tax evasion were reportedly being handed down late last week.

According to court documents, Con'puter generated more than $160,000 in clear profits for the partners from 1976 to 1979.

Prosecutors also contended in court documents that between July 1979 and June 1980, three of the partners earned an average of more than $24,000 that was not reported for state tax purposes.

"They wanted to squash our business because we were functioning so well and they had been trying to get their hands on that program for 14 years," said Quillen, who was moved from MCI-Framingham to MCI-Norfolk after the raid. "I don't know what it is. The Department of Corrections keeps yelling rehabilitation, but it really rubs them the wrong way when they see people in jail doing good and they do everything in their power to stop you from doing it."

Quillen also contended that the Department of Corrections wanted to prevent Susan Saxe from obtaining parole. Saxe is serving 12-14 years at MCI-Framingham in connection with the slaying of a Boston police officer during a 1970 bank robbery.

"The service bureau is gone. You can forget that," he said, adding that the training program may be reinstated at some point in the future, but would operate under very strict guidelines from the Department of Corrections.

Quillen explained that training for the DP program, which was initiated in 1967, was handled by the inmates themselves after the first group of instructors was trained by Honeywell, Inc. Honeywell provided testing and certification of the inmates after they completed each phase of the nine-month program.

As a way of using the training they had received, the inmates began handling work for state agencies such as the Department of Corrections, the Department of Taxation and Incorporation, the Department of Labor and Industry and the Department of Public Health.

A spokesman for the Department of Corrections indicated that an awareness of irregularities occurring at MCI-Framingham prompted the investigation by the Middlesex County district attorney's office and the subsequent raid. He said evidence is still being presented to the grand jury and further indictments are anticipated.

Peter W. Agnes Jr., assistant district attorney for Middlesex County, could not be reached for comment.

Most Responses Anti Cobol-80

(Continued from Page 1)

sion, as well as other factors, "which is what we were looking for," he noted.

"I don't think anybody anticipated the replies and the amount of detail that came through. It was a lot of very good work," Brophy said.

"Some of the costs were staggering," he added, describing the conversion costs that came out of the respondents' analyses. "It varies by company, depending on their situation and also what costs they include, but it is at least 50 cents a line of code to convert."

The overwhelming response to the issue "will be very helpful" to Cobol-80 standard opponents including Brophy [CW, Nov.16]. "It proves the point that a lot of people are concerned and justly so."

He speculated that because of the overwhelming response, there is a high likelihood that the X3 committee will require that the X3J4 technical subcommittee go back and review the issue of upward compatibility from a user point of view. Over the next two to three months, the X3J4 subcommittee will analyze responses and formulate a plan.

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MERLYN CORPORATION

Could Pass House by July

Wirth Eyes Start of Rewrite Bill's Final Draft

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — Final drafting of legislation to replace the Communications Act of 1934 should begin at the end of this month, Rep. Tim Wirth (D-Colo.) said here last week.

Wirth is chairman of the House of Representatives' Telecommunications Subcommittee, which has been struggling for the past seven years to write a new national telecommunications policy. He told the Computer & Communications Industry Association here last week that he expects the latest version of the rewrite legislation, H.R. 5158, to pass the House and "in June or July" go to conference with the Senate. The Senate has passed its own rewrite of the Communications Act — S. 898.

The Colorado congressman has rejected advice from Assistant Attorney General William Baxter and Bell Laboratories, Inc. Board Chairman Charles Brown that Congress wait "until the dust settles" from last January's proposed settlement of the U.S. vs. AT&T antitrust suit before moving ahead with legislation. It will be late April at the earliest before presiding Judge Harold Greene decides whether to accept the agreement signed by AT&T and the Justice Department, according to Wirth.

'Perfect Time Frame'

It may take six additional months before AT&T completes the reorganization plan mandated by the settlement. This will provide a "perfect time frame," Wirth said. He said that he expects the House bill to be passed by the Telecommunications Subcommittee and possibly by its parent, the House Interstate and Foreign Commerce Committee, quickly enough to be considered by Greene as he considers the proposed settlement. According to Wirth, legislation is needed to deal with several areas not covered by the agreement:

• "We must still address the questions surrounding AT&T's long-distance monopoly to ensure that the interchange market can become competitive while, in the interim, monopoly ratepayers do not subsidize the cost of AT&T's competitive ventures," Wirth said.

• Another major concern is "the continued maintenance and upgrading of AT&T's interexchange facilities so that the benefits are available for all," according to Wirth. Wirth and several colleagues are concerned that if the unregulated part of the "new AT&T" is allowed to own transmission facilities, the company will pour money into these facilities and allow the present telephone network to deteriorate.

• The antitrust settlement raised a related issue by permitting the undivested part of the present Bell system to offer local as well as long-distance services. "The resulting loss of revenues to the local-exchange carriers would have a major impact on local rates," Wirth said.

• Wirth also indicated that he is unhappy about the provision in the settlement agreement that allows certain activities of the divested Bell operating companies to be performed on a centralized basis. "If the BOCs [Bell operating companies] have one central procurement authority, as the settlement permits, we can expect significantly less competition than if each BOC procures independently."

• Bell's patents are another major concern for Wirth. They were "funded in the monopoly environment" and contain "technical information critical to the use of AT&T's long-distance services. Without the availability of such information, it will [be] more difficult for Bell's customers and competitors to interconnect with the network," he said.

House: FCC Incapable of Regulating AT&T

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — If Congress does not further restructure AT&T, the Federal Communications Commission (FCC) will have to regulate the phone company on the basis of the consent decree settlement worked out last January. And the commission is incapable of doing an adequate job of it.

So said the majority staff of the House Telecommunications Subcommittee early this month in a lengthy discussion of the issues and options that still have to be considered before work is finished on H.R. 5158, the subcommittee's pending rewrite of the 1934 Communications Act.

Of the four options proposed, one was clearly preferred: requiring AT&T to establish a separate subsidiary for interexchange transmission services.

"The long-distance market is not subject to effective competition today and should not be deregulated," the report contended. The report added that because of this monopoly, once AT&T can offer products and services on an unregulated basis, it has "powerful incentives" to cross-subsidize surreptitiously those offerings with revenues earned from customers of its monopoly services, causing their rates to go up, the report said.

As the report put it: "We believe . . . the economy and the telecommunications industry will benefit from AT&T's entry into such fields as computer manufacture and data processing. At the same time, if AT&T is going to enter unregulated fields, its economic incentive to misallocate costs and cross-subsidize must be reduced."

H.R. 5158 and the companion bill drafted in the Senate, S. 898, address these problems, but are now out of date because they were written before last January's agreement between AT&T and the Justice Department. Each bill, for example, requires Western Electric Co. and Bell Laboratories to establish separate companies to work for the regulated and unregulated sides of the Bell system.

According to the subcommittee, however, the consent decree — by requiring divestiture of the Bell operating companies — makes this separation unnecessary.

The FCC's Computer Inquiry II Decision is also flawed, the report said. The decision requires AT&T to establish a separate subsidiary, but only to market terminal equipment and enhanced services. The related manufacturing and research and development activities would remain integrated with the regulated side of the Bell system, leaving a major cross-subsidy opportunity in place.

If Congress does not act, according to the report, the task of controlling AT&T will be left to the FCC, and "the record . . . makes clear that the FCC and its accounting protections have not and cannot resolve these problems."

The subcommittee's final option, requiring AT&T to establish a "separate sub" for long-distance transmission, will almost certainly be opposed vigorously by the phone company.

A number of AT&T officials in recent weeks have contended that the long-distance communications market is competitive, that competition is growing and that AT&T, in the face of this competition, must be allowed to offer integrated services that combine regulated with unregulated offerings.

City Hires DP-Based Firm

Bostonians Protest Parking Fine Collection

By Jim Bartimo
CW Staff

BOSTON — The computerization of parking ticket fines is working well here — perhaps too well. Led by local radio talk show host Jerry Williams, some 400 protesters recently marched from the city's fashionable downtown shopping area to Waterfront Park, where they dumped copies of parking tickets into the garbage and chanted anti-parking ticket slogans.

While many of the complaints center around the city's motives in the recent increase in ticketing and collecting, there is also anger about computer errors. "The computers are all screwed up," Williams said. "People are being booted three and four times after paying their fines."

"Booted" refers to the use of the Denver Boot, a car immobilization device attached by police officers to a car's wheel and removed only when the owner pays his ticket fines.

Williams has leveled charges that the city is using parking tickets as a new tax in the wake of the state's implementation of Proposition 2½, a tax-cutting measure modeled after California's Proposition 13.

Boston's hiring of Datacom Systems Corp. of New York, said to be the largest municipal debt collection firm in the country, coincides with legislation that took effect Jan. 1 and places more control of ticket collection in the hands of the municipality, according to Ken Glidden, first assistant collector and treasurer in Boston's Treasury Office.

"There was a substantial backlog of tickets," Glidden said. It is expected that some $12 million will be collected this year that would not have been collected without the aid of Datacom's computer system, he said.

Harry Voccola, a vice-president at Datacom who is responsible for overseeing activities in Boston and other cities, said that Datacom can process tickets at one-half to one-third the cost of present methods, which are usually manual.

" 'Collection agency' is really a bad word for what we do," Voccola said. "We do much more than that. We physically replace the processing of the tickets."

A staff of 60 data processers will work three shifts, 24 hours per day, seven days per week to collect on 10 million parking tickets issued nationwide this year. Armed with a data base from the individual state's department of motor vehicles, Datacom matches up a newly issued parking violation with the department's information to issue a bill to the offender.

"In most cases," Voccola said, "the city gives us the tickets and doesn't hear from us again until we give them a check." According to Voccola, $50 million will be collected nationwide this year that would not have been collected at all if it were not for the computerization of the ticket processing. "They're not writing more tickets, they're just enforcing it more," he said.

Williams has criticized the accuracy of Datacom's ticket collection on his daily afternoon talk show. He read from a *Computerworld* article [CW, Feb. 8] that reported a woman received 20 parking tickets even though she had suffered a disabling stroke and turned in her registration plates months earlier.

Williams explained that others have filed suit against the city, as he expects his group will, because "your property is seized without due process. In many cases a car is someone's livelihood and to get it back, you plead guilty to the charges when you pay the fines."

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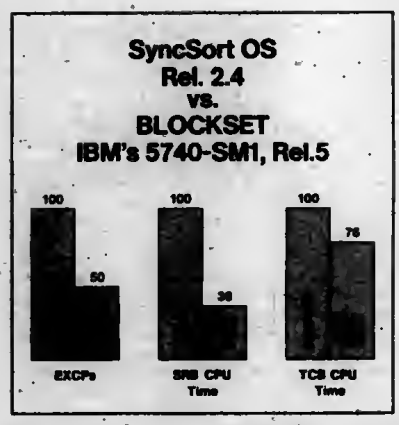

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Continental Illinois Corp.
Chemical New York Corp.
Bankers Trust New York Corp.
Western Bancorp.
First Chicago Corp.

2. Here are the 10 largest life-insurance companies.*
How many use SyncSort?_____

Prudential
Metropolitan
Equitable Life Assurance
Aetna Life
New York Life
John Hancock Mutual
Connecticut General Life
Travelers
Northwestern Mutual
Teachers Insurance & Annuity

3. Here are the 10 largest utility companies.*
How many use SyncSort?_____

AT&T
General Telephone & Electronics
Southern Company
Pacific Gas & Electric
American Electric Power
Commonwealth Edison
Southern California Edison
Consolidated Edison
Middle South Utilities
Public Service Electric & Gas

4. Of the 30 companies listed above, how many use SyncSort?_____

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2. 9 of the 10 largest life-insurance companies.
3. 8 of the 10 largest utility companies.
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EXPLANATION OF ANSWERS: Sorry, professional ethics prevent us from telling you specifically which companies on the list use SyncSort. But we'll be only too glad to tell you why:

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- *Productivity:* For programmers, SyncSort removes the "grind" from sorting. Using features like INCLUDE/OMIT, SUM, INREC/OUTREC and others, the time required for simple applications can often be reduced from five programmer days to one programmer day.

- *Service:* Need a little help on tricky sorting questions? Call our Technical Service faculty. They're experts at providing fast, accurate and sympathetic coaching. More than 85% of all requests for help are resolved within 24 hours.

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- 7 to 14 companies use SyncSort—give yourself a C. Go back to the library and review sorting problems and how SyncSort solves them.
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*According to Fortune Magazine 1981.

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Abrupt Move, New Understanding

DPer Jumps Information Fence, Becomes User

By Jeffry Beeler
CW West Coast Bureau

SAN JOSE, Calif. — Marilyn Carson used to like the computing field better than anything else in the world. She enjoyed it so much, in fact, that she thought she would never leave.

But slightly more than 18 months ago, Carson abruptly did the unthinkable. She left the computing field and jumped to the other side of the information systems fence.

In short, she suddenly became a user.

Since then, Carson's role in the information systems scheme of things has changed profoundly. "I'm suddenly in a totally different situation from anything I've ever experienced before," she said. "Now I'm involved with automated services not as a provider, but as a recipient."

The broadening of Carson's professional horizons began in July 1980, while she was still serving as DP director for the Santa Clara County Office of Education. At the time, the office's assistant superintendent for business administration was preparing to begin a sabbatical and Carson was asked to take his place.

She accepted the offer — with mixed emotions — and was promptly appointed acting assistant superintendent for business administration. She suddenly found herself in charge of a department that had hitherto been one of her users.

When her predecessor in the job returned from his sabbatical, she remained in the Office of Education's business administration division as his associate, a post she continues to occupy. Carson oversees all the office's word processing, payroll, personnel, general services, centralized purchasing and service fund activities. In addition she receives regular reports from her DP-department replacement, whose operation falls within the scope of her authority.

Although still a relative newcomer to the ranks of nontechnical management, Carson has already greatly expanded her end-user awareness. "I now realize that many of the problems that afflict DP are also common among users," she said. "Those users have data needs that can't be satisfied unless they get an adequate level of support from the people in computing."

Her experiences as an end user have also given Carson a fresh perspective on her own specialty — computing — by giving her a glimpse of what her former working environment looks like from the other side.

"Today, I understand a whole lot better than I did before why people in nontechnical positions often criticize computing personnel," she said. "I understand why people say DPers are unresponsive, don't comprehend user problems, take too long to develop new systems and charge too much for their services."

The widespread belief that computing personnel are insensitive to user needs and provide unsatisfactory services is often unfounded and stems largely from public ignorance of "the DP problem," Carson said.

Another important by-product of Carson's recent defection to the end-user camp is that she has abandoned her longstanding bias toward mainframes and no longer views emerging technologies as a potential threat to large systems' supremacy. Nowhere has this increased receptiveness to new ideas manifested itself more clearly than in her changing attitude toward microcomputers and word processing.

Marilyn Carson

"Prior to assuming my current position, I think I would have gone to the mat to fight having any kind of application put on a word processing system or a micro," she recalled. "I would have taken such a move as a personal insult because it would have seemed like an effort to bypass and discredit my central system. For me, the issue would have been territorial.

"Now, having had an opportunity to see what the real world is like, I realize that, hell, there's no such thing as territory. There are only problems to be solved and one uses the best solutions one can find. It makes no difference what the solution is."

As for the question of whether she prefers working as a DPer or an end user, Carson appears to have formed no strong opinions either way. Each role, she said, offers certain advantages over the other.

"Even today, I still love DP, especially the beauty of its logic," she said. "It's so clear. There's always a way of getting from point A to point B."

But managing an end-user department also seems to have undeniable rewards. "The best part of the job I'm doing now is that I'm getting a chance to learn about a lot of areas I never even knew existed and probably never would have been exposed to if I had continued to work indefinitely in DP," Carson said. "I also like having the opportunity to apply my computing knowledge and background to the new problems and activities I'm encountering as end user."

Applications Programmers Not in Danger

(Continued from Page 1)

"Even if packages are bought, they have to be debugged and tweaked to fit the business needs of the company," he contended.

The DP world is moving toward minicomputers, according to Tyson. This trend means that programmers will have to hone their skills and develop a feel for a system's entire operation, rather than concentrating solely on programming requirements. Tyson is currently involved in converting his shop from a large IBM mainframe environment to one employing Wang Laboratories, Inc. minicomputers.

"Each kind of machine has different attributes that the programmer has to know," he said. "For example, the IBM mainframe obviously has a lot faster processing power than a mini, so the programmer must become a bigger part of the entire system's design so he can program the machine correctly. He must also know the company's business nuances in order to modify a new package."

Tyson added that to keep up with the pace, the applications programmer of the near future will have to know a lot about specific applications rather than specializing in just one part of a job. "A programmer won't be able to get away with just knowing an Ansi Cobol language, but will have to know how it works with the machine," he said.

Programmers Must Change

Bruce Newmann, a New York-based recruiter with Fairon-Rambeau, a placement firm specializing in programmers, agreed with the premise that programmers need to change. While the nature of entire systems is not changing, the skills that programmers will need to work with these systems are undergoing some change, he said.

Purchased software packages will not hurt the applications programmer's future, according to Newmann. He suggested, however, that programmers will have to get more involved in on-line programming and remain as technical as possible. In the past, Newmann said, applications programmers aspired to administrative positions, but now these jobs are "locked up."

"The applications programmer today has to remain technical, get involved with on-line processing and know minicomputers," he stated.

A specialty Newmann referred to as "software programming" is developing rapidly. This area will require programmers to modify and tailor software packages to meet a company's particular specifications. "This area lies somewhere between software design and systems design, and a lot of companies are looking for individuals with these types of qualifications," Newmann said.

Senior analysts will not be hurt by purchased software because the packages usually have to be redesigned, he added. "A lot of companies buy packages just to see what they can do and not necessarily for in-house use," he stated.

Packages No Threat

Lennox Melville, a senior programmer analyst for the United Way of New York and New Jersey, agreed with the general consensus that purchased software packages do not pose a threat to applications programming. Noting that packaged software is part of his IBM System/38 environment, Melville pointed out that these packages must be tailored to specific situations.

"An accounts payable package, for example, is the same application no matter what, but an accounts receivable package has to be modified specifically to the organization," he said.

The problem of purchased packages seems to have even less effect in large systems environments. Jeff Kostiv, a programmer for NBC here, felt that programmers working in minicomputer environments are more likely to work with purchased software.

"In large systems, things have to be more specialized. We here at NBC don't see too many packages at all. Maybe a couple of sort packages," he said.

A project manager for a large area bank agreed with the overall perception that no matter how sophisticated packages become, programmers will have to act as watchdogs for purchased software. While admitting that the number of applications programmers in an installation might decrease in the future, he characterized these DPers as an "adaptable lot" who can change if change is necessary.

He pointed to the fact that many programmers become bored and leave their jobs to perform consulting work just for a change. "They may even like the need to change," he said.

Jack Gelin, a Cobol programmer for Chargit Co. in New York, noted that good software packages actually make his job easier. "It would take years to write some of them myself," he said. Commenting on the future of his job, he maintained, "The industry will always need applications programmers to write programs, test them and to do all of the dirty work."

'Comet' Users Slate Meet for April 7-8

SAN FRANCISCO — The Fourth Annual Electronic Mail Symposium and Comet Users Group Meeting, sponsored by Computer Corp. of America, will be held here April 7-8 at the Hyatt Hotel.

The meeting will focus on both concerns about and new applications for electronic mail, including its role in word processing, data base management, international communications and as a white-collar productivity tool.

There is no cost for attending the conference. Reservations for the conference should be made with Computer Corp. of America, 675 Massachusetts Ave., Cambridge, Mass. 02139.

Psychologist Says Stress on DP Managers Causing Computer Revolution Casualties

By Bruce Hoard
CW Staff

LA JOLLA, Calif. — DP managers under mental pressure from their jobs are going to a psychologist here who wants to help them and others who may be casualties of the computer revolution.

After treating a variety of DP managers, psychologist Dr. Thomas F. McDonald of the Transition Associates Clinic found he had developed serious interest in an area he maintains is still largely uncharted.

Overwork, short lead times and large backlogs are just a few of the millstones dragging down DP managers, he said in an interview recently.

Interfacing With Users

More importantly, the DP bosses are running into trouble when they have to deal with users in addition to maintaining the day-to-day operations of a computer center. "This kind of person is really not very skilled at interfacing with people," McDonald said. "Their whole background and history has been with computers."

Many users do not know anything about computers, but because "the culture has more or less deified the damned things, they expect simple perfection and I might say they've been educated to think they can get that from a computer."

When the users do not get what they want because a computer has broken down or there is too short a lead time, they put heavy pressure on the DP managers. However, the DP managers do not have anybody to unload their troubles on, but must try to coax more productivity out of a computer that may already be running at peak capacity, he declared.

Sometimes, Vendors to Blame

McDonald accused some computer vendors of failing to fully inform buyers of the manpower needs their computer will require and cited the plight of one of his current patients. This DP manager is employing three people to maintain a computer system that the manufacturer claims requires at least seven, he said.

In this instance, the end result is an alcohol problem, divorce and the search for a new career. But finding a new career can be tough, the psychologist observed. "He doesn't know where else to go. These kind of people are very high-tech-oriented people and where do you go when most of your life is spent with computers?" he said.

Although he has not yet worked with programmers, McDonald said they have to deal with "the rigidity of procedures" required by logic-driven computers.

He offered some hints for uptight DPers:

- Take a break, walk around and try to get some physical activity.
- Do not take on more work than can be reasonably completed.
- Take a long-term philosophical approach; the outcome of the world is not dependent on the success of a computer program.
- Be forgiving.

No matter what the DP job category, the technicians usually come to McDonald complaining of domestic rather than professional problems only to find out the root of their woes is work. The psychologist wants to bring his own work to the DP environment, eventually conducting preventive seminars designed to help DPers detect internal problems and correct them before they get out of control.

The DP shop is not the only place where computers are spreading their electronic tentacles. For example, video games give the kids who play them all day long an "inordinate sense of power" that many adults feel is not good for them, he said.

He foresees a day in the not-too-distant future when the increasing acceptance of computers will open up a potential Pandora's box of psychological and sociological questions. He lauded California Gov. Jerry Brown for establishing a blue-ribbon committee charged with investigating how Californians can become computer literate.

"We're going to have two classes of people," McDonald said, "those who are computer literate and those who are computer illiterate. It's going to be very difficult for a person not to be conversant with how to interact with a computer."

Dr. Thomas F. McDonald

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To Spur Productivity Growth

Reagan Seen Redrawing High-Tech Policy

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The Reagan administration is going back to the drawing board for policies to spur productivity growth in the emerging high-technology era, a Commerce Department official said last week.

Pointing to the decreasing costs of information, Egils Milbergs, director of the department's Office of Productivity, Technology and Innovation, remarked, "We're now developing technology that expands our mental capacities."

But, he said in his keynote address to the Federal Office Systems Expo here Tuesday, the U.S. is falling behind other countries in efforts "to exploit this technology for professionals."

Milbergs noted that the White House has established a National Productivity Advisory Committee. However, he added, "We don't want to produce another report or study."

High-Level Status

The committee, which has subcommittees on technology and innovation and human resources, will provide recommendations directly to the Cabinet Council on Economic Affairs, so that its work will be linked closely to the highest levels of White House policy making, according to Milbergs.

In 1978, the Carter administration set up an advisory committee on industrial innovation, which, representing industry, academia, government and public interest groups, presented a number of recommendations for improving productivity in American industry.

But according to Milbergs, previous productivity prescriptions relied too heavily on government intervention in private industry.

He indicated that different approaches are necessary in the present environment of government deregulation and reliance on private-sector initiatives.

"We don't think it's appropriate for the government to pursue what's called an industrial policy approach," he continued, rejecting proposals that the government pick the "winners and losers" in future industrial sectors for special government backing.

The government "is not smart enough," he said, to oversee the resource allocation implied under such a system, which has worked well for the Japanese.

The proper role of government, Milbergs said, is to reduce "the risk and uncertainty of doing business" that results from "stop-and-go" regulatory action. The government can "develop an economic climate for private-sector productivity improvements."

By pushing tax reform, regulatory relief and providing for a healthy overall U.S. economy, the federal government can promote competition, reduce government control of industry and produce a climate conducive to long-term planning and investment, he said.

After detailing the steady decline of American productivity growth over the past decade, Milbergs said: "It took us a long time to get into this mess and it's going to take a long time to get out."

Productivity Aid

He said his office will complement the work of the productivity advisory committee by:

- Instituting an industry analysis and productivity research program to scrutinize a number of key industries.
- Setting up a Commerce Department productivity center to provide information on ways to improve productivity. Office automation will be "high on the list" of the center's interests.
- Evaluating the feasibility of helping trade associations set up programs to measure the productivity of their members to find out why different companies in the same industry can have widely varying productivity levels.
- Seeking ways to disseminate the results of the $9 billion worth of federal research and development conducted at 700 government laboratories.
- Promoting "collaborative programs" between industry and universities in R&D and technological innovation.
- Developing new patent policies for federally owned inventions and for processes and products developed with federal funding.

Touching on the problems of manpower shortages in key technological industries, Milbergs explained that in the future "human resources will be much more important than capital" in the struggle to raise productivity.

But suggesting that automation and reduction of manpower needs is not the answer to declining productivity, Milbergs added that the future will not be one of "management vs. labor. It's management and labor against the world," he said.

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Jack S. Kilby: Inventor of the Integrated Circuit

Jack S. Kilby, the engineer credited with developing the integrated circuit in 1958 while employed by Texas Instruments, Inc., was recently inducted into the National Inventors' Hall of Fame.

Computerworld's Tom Henkel interviewed the man who conceived the idea of forming electronic components, such as resistors, diodes and capacitors, within a single monolithic block of semiconductor material and connecting them to form a complete circuit.

Kilby is currently a consultant at TI and a visiting professor at Texas A&M University.

Q. What events led np to your development of the integrated circuit?

A. In the late 1950s there was a recognition that there might be a better way to put electronic equipment together. There were three main approaches at the time; each one was sponsored by a different military service.

The Army felt a technique called the "Micro Module" was of interest. This was basically a repackaging program. The components would be made the way they had been, but they would all be given a uniform size and shape. If they could be stacked together, it would be possible to automate the interconnection process.

The Navy didn't have much activity, but they invented their version of thin film technology. They established programs for work with thin film active devices, transistors in particular. They already knew how to make some passive components such as resistors and capacitators.

The Air Force had a program which they called "Molecular Electronics." They basically felt that everything that had been done in the past was wrong. If they thought about it for a while, they could systematically [develop] a semiconductor device arranging circuits functions.

All of this work was under way, and at least somewhat visible by 1958, at the time I decided to leave my job at Central Labs [a division of Globe Union] and come to TI [Texas Instruments, Inc.]. At that time, [Central Labs] was very active in making what would now be called thick film passage circuit components. That is the network of resistors and capacitators that were widely used in radios and televisions and, to a small extent, computers of the day. Those were the activities that set the stage.

Q. How did your design differ from the technology of the day?

A. We proposed to make all the circuit elements from a single semiconductor material. We [thought we could] make them all on a single surface of a semiconductor and interconnect them.

This differed from the molecular electronica approach of the Air Force. They had hoped to depart from circuit technology. They felt things like resistors were a waste of power.

One of the great strengths of the integrated circuit approach was it was able to draw on all the things we knew about circuit design. Another great strength was it drew on semiconductor technology, which was advancing very rapidly during that period. It was important that the concept was in the mainstream of semiconductor technology and was able to benefit from the improvements going on there.

Q. Were there others working on similar techniques?

A. There were others working on ideas with the same broad objective, that is, the idea of impacting the way electronic equipment was built.

Q. Were you suprised at the speed with which the industry developed after the integrated circuit was introduced?

A. It moved very rapidly, of course, but we made some predictions in the first few years on what the new techniques would be able to do to the cost, to society, what it means. We were being as ambitious as we could without removing all credibility in the process. Most of those [predictions] proved to be rather conservative. In that sense, I guess you could say it moved more rapidly.

Q. The integrated circuit was deaigned at a time when mainframe processors were beginning to gain acceptance as business tools. Did you envision hand-held calculators, microprocessors and electronic gadgets?

A. Not specifically. The projections I mentioned made it clear that we thought we would make orders of magnitude reductions in cost, size, weight and reliability of electronic equipment. But at that time we weren't very specific in the areas that would be impacted.

Q. What were some of the problems involved with developing the integrated circuit? How were they overcome?

A. There were problems of several types. There were certainly technical problems. We were pushing the limit of semiconductor capabilities of the time. Even though it was in the stream of the technology, we were using it in ways which pressed things.

The second area, and one that is forgotten now, is the difficulty of selling the basic concept. The question of whether monolithic integrated circuits would ever amount to anything provided the entertainment in almost all of the technical feelings of the early '60s. I guess there were a few major organizations that took 10 years to be convinced. There certainly were problems of that sort.

Q. How will circuit technology change over the next decade? What new developments can we expect?

A. The short answer seems to be we're in for more of the same. Certainly circuits will become more complex and probably will get somewhat faster. The cost per unit will continue to decrease.

A 10-year period, though, is a very long time. The new applications in 10 years really can't be anticipated at this time.

Q. Will we still be using silicon technology?

A. I think silicon's position is pretty well established. It is very difficult to imagine another material taking its place in the mainstream of activity.

Replacement is not likely for a lot of reasons. The chances are that if a new material comes along that is better at some things than others, it will make real changes in the product itself, not just the material format.

Q. What about heat dissipation problems?

A. This is particularly a problem for mainframes. Each of the mainframe makers has worked out a technique to live with the situation. There has been a good deal of progress in reducing speed-power product, permitting substantially greater throughput at the same power level.

Q. What do you feel your contribution has been to technology?

A. It's very hard to say. There is one theory that says everything will be invented sooner or later, all you have to do is wait for it. I think I helped accelerate some of these trends.

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Two-Year Study Conducted

Illinois Bell Describes User Report Techniques

By Marguerite Zientara
CW Staff

SCOTTSDALE, Ariz. — Customers want simplified, meaningful and easy-to-read reports from the DP department — that's obvious. What is not so obvious is how to develop the reports and get them out to the users.

One company that succeeded in doing just that is Illinois Bell Telephone Co., according to Andy Kalicak, manager of capacity planning.

In his "Evolution of Interesting and Non-Boring Service Reports" session at the Conference on EDP Performance Management here recently, Kalicak described a two-year study of varied and ever-changing user wants and needs that paid off in effective reporting techniques.

Kalicak's project began when he realized that no one was reading the reports his department was putting out, even though they were in bar chart form. The problem lay in the different types of information each user needed — the bar chart simply did not highlight the correct information for everyone.

Small but significant errors had crept into the reports "and nobody ever noticed them," he recalled.

Kalicak sent out a seven-page questionnaire that included multiple-choice, essay and true-or-false questions to which three-quarters of the recipients responded, Kalicak said. The questionnaire stated the purpose of a certain report, asked whether the report accomplished its purpose and whether it contained too much or too little information, asked how the user used the report and asked how the user would improve the report.

A major finding of the survey was that users were not interested in total performance charts, but rather only in their personal gains, how the report related to them. How, then, does one decide what to report?

Talk to User

"What do I tell the manager of operations so he knows the system is being used effectively?" Kalicak had to ask himself. "You have to sit down with the user, talk about what they need, how much it will cost and how much you can afford to give it to them."

Then you have to get to know your data better. "You must know what the data is, its purpose and how important it is to users," he said. Once you have identified what is to be reported, you must determine the correct report format: graphical, tabular or verbal reporting. Graphics are easy to understand quickly, "but maybe you need to put too many graphs together to get the message across," he noted.

Tabular reporting contains a tremendous amount of data, but one cannot figure out any trends by looking at it. Tabular reporting is good for giving specific numbers, he said. In verbal reporting, the DP manager would go to the user and tell him his own personal perceptions of the reality of his performance situation.

"In general, the charts help the user, the capacity planner, to understand when and why he has to spend more for what he wants," Kalicak said.

Lastly, you must "learn 'em how to use it," Kalicak said. For example, in some cases, a user has to keep last month's report in order for this month's report to be meaningful. That should be explained specifically.

Today, Kalicak's group issues only two performance reports: a profile report and a users report.

Managers On the Move

SUSANNE N. KELLY has been appointed manager of applications development in the agricultural group of American Cyanamid Co., Wayne, N.J. In her new position, she will manage the implementation of information services systems.

Prior to joining the company, Kelly had been with the European American Bank where she was a vice-president.

She is a graduate of Chatham College in Pittsburgh, Pa.

— — —

J. KEVIN BRADY has accepted the post of data processing manager for Micro Data Base Systems, Inc. (MDBS) of Lafayette, Ind. MDBS markets software for microcomputers and minicomputers.

Brady was previously manager of systems and programming with ZYX Corp., a project manager with Computer Management Systems and held a variety of technical positions with Whirlpool Corp.

He has a B.S. in science from Ball State University and an MBA from Indiana University.

— — —

ALAN STEINBERG has been appointed manager of computer services, a newly created position at Summit Airlines in Philadelphia. He is responsible for the design and implementation of a new computer system in addition to the administration of the airline's current computer system and its operating personnel.

Steinberg's previous experience has included six years as a data processing consultant with Vistacomp Corp. Prior to that he was a practicing clinical psychologist.

He holds a B.A. in mathematics and an M.A. in psychology from West Virginia University.

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ACCESSORIES AND PERIPHERAL EQUIPMENT

DP Manager Explains User Service Agreement

By Marguerite Zientara
CW Staff

SCOTTSDALE, Ariz. — While the user service agreement is not yet a given in all installations, perhaps it should be.

As one with experience in negotiating such agreements, John C. Koltes, manager of systems management support at General Mills, Inc. in Minneapolis, described the purpose and contents of such agreements recently at the conference on EDP Performance Management here.

A key purpose of a user service agreement is to build relationships between users and information systems, Koltes said. In addition, such contracts define user and information systems critical success factors, align performance expectations and define service level responsibilities for the user and the DP department.

While many users object to the concept because they dread extra red tape, the user service agreement should be regarded as an opportunity for improved information systems resource planning. Although it does place new requirements on users to manage their information systems interfaces, the agreement also ensures that the information systems resource is constantly reviewed to meet changing business needs, Koltes pointed out.

Within a user service agreement is included a service level summary with service level statements, a renegotiation clause and signatures and dates. As Koltes noted, "we must consider renegotiating if we're not meeting users' needs."

Also included are service level criteria, examples of which include computer systems availability, average response time for on-line access, scheduled resource availability and input availability to job completion. Other criteria are report requirements, problem responsibility and average problem response time.

The section of the agreement that details information systems and user responsibility is where "most of the negotiation takes place," according to Koltes. It contains such specifics as what time a certain job must be submitted to DP in order to be ready at another specified time.

While a glossary for agreement specifications is optional, critical print file identification is a key area, Koltes noted, citing also the need for user work load forecasts for major systems.

Last of all, one must establish a service agreement tracking log, although, Koltes emphasized, "we don't track every report, only those critical to users." In his shop, "out of three million pages a month, they track only 26 reports, and it is not an automated function, although we hope it will be some day," he said.

Measurement Criteria

Listing some service agreement performance measurement criteria, Koltes noted, "there is a tendency for the user to overstate his requirements and criteria; they've got to be manageable."

In computer operations, measurement criteria include percent of machine uptime, on-line response time, job scheduled vs. forecast, average job time in to time out, percent of jobs completed on time, problems logged and average problem response time.

In the area of output and distribution, the criteria are: number of reports, number of pages produced, percent of reports out on time, reports rerun due to specific error and microfiche produced.

Applications support criteria include average problem response time and systems maintenance requests. Specifically, the agreement tracks maintenance requests received, completed, backlog; priority, nonpriority backlog; estimated vs. actual maintenance requests completed; and average maintenance request completion time, he noted.

Distributed systems support encompasses percent of network uptime, percent of output sent on time and percent of input received on time, he said.

Establishing an agreement is not easy, Koltes stressed. The main problem is building credibility for the agreement. "Not all users want one," Koltes said. "They get the feeling it means more work for them, and it does — they have to give us information to plan our resources better."

Users also dislike the feeling of more red tape and of newly limited computer access. "In some cases, we now have to make the user schedule what he used to do on his own," Koltes acknowledged.

"On the other hand, with the agreement the user isn't doing any more than he did before — he's just defining levels of service and putting priorities in writing."

Another problem is that, if the system is running well, service agreement development takes a back seat.

Other serious problems can arise if people leave the company during negotiations or demonstrate a lack of commitment. "It has been said it should take six weeks to develop a service agreement, but I have seen it take up to seven months," Koltes said.

DP Managers Cite Awareness Of Corporate Plan as Essential

By Marguerite Zientara
CW Staff

SCOTTSDALE, Ariz. — While DP managers traditionally have been left in the dark about top management's business plans, it is essential that they learn about the overall corporate plan and adjust their operations to anticipate the future.

That was the consensus of about 50 fired-up managers in attendance at a panel session on "planning" at the recent conference on EDP Performance Management here.

An informal "microsurvey" by session chairman Phillip C. Howard, president of conference sponsor Applied Computer Research, Inc., revealed that while no one was completely ignorant of his company's plans, only 25% felt they were doing a good job of capacity planning.

Five people indicated they did not see the corporate business plans at all and seven worked at firms without a formal plan. About a third felt their companies did a good job of business planning, although subsequent comments by attendees suggested that the very idea of DP awareness of the corporate plan is entirely new.

A complication of the issue is the pervasive feeling that business itself, in many cases, does not know where it is going, a situation that breeds "frustration," according to panelist Stewart Sterm, manager of technical services at Stratford, Conn.-based Sikorsky Aircraft. DP then becomes the victim of "American industry's going for the short term," he said.

When business does not know what it is doing, however, and just does not bother to tell you, one way to educate yourself is to "read the *Wall Street Journal*, *Forbes* and *Business Week*, not just *Datamation* and *Computerworld*," Howard suggested.

What You Should Do

What should you do if you suddenly learn of something entirely unexpected and disruptive such as a merger or if a strike action is called, with major impacts on DP capacity?

One attendee's suggestion: "Go back to your installed applications, determine the percentage of use in each one and see what can be eliminated."

Such an unusual event can be "the best thing for your career," according to panelist Melvin Strauss, vice-president at Chase Manhattan Bank, who recalled what happened when Chase Manhattan decided to distribute data processing.

"We were the only ones who knew the applications so everything came through us," he said, stressing that high visibility to management is an advantage.

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DP Manager Tackles Budget-Cut Nightmare

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — After 15 years of building DP organizations in the White House, the Office of Management and Budget and the Department of Energy, Al Linden was confronted with a manager's nightmare — a 50% budget reduction with no corresponding decrease in work load.

While most DP shops have weathered the recent economic storm with little hardship, Linden, deputy administrator of the Energy Information Administration (EIA), was caught by the full force of the Reagan administration's deregulatory fervor and its plans to disband the Energy Department.

"When the word first breaks that there's going to be a reduction in force, the first thing you want to do is roll over and die," Linden recalled at a recent conference here. But, he said, through "creative management, innovation and communication ... we've been able to minimize the impact on personnel and, at the same time, maintain essential services."

Sharp Cutbacks

Although his position is not unique in today's cost-conscious federal environment, Linden's corner of the bureaucracy faced particularly sharp cutbacks. From a staff of 826, including DPers, statisticians, managers, clerks and secretaries, the EIA lost 31% in fiscal 1981 alone. Between fiscal 1981 and 1983 his budget dropped almost 50%. But "not a damn thing changed in what [we are] required to do," according to Linden.

"The first thing we said was, 'Don't panic,'" Linden noted, recounting his efforts to keep the organization running and to hold on to his best people while trying to find the rest new positions in other agencies and in the private sector.

The management staff tried to remain flexible in its planning for operations after the reductions, he said, but it worked against well-thought-out goals by asking "what is the minimum resources we must have to do [each] job?" Managers were assigned planning responsibilities for departments other than their own so they would look at the operations with a fresh and unbiased eye, uninfluenced by turf-protection instincts, Linden said.

Reductions do not mean all the innovative and creative applications must end, he said. In fact, according to Linden, just the opposite is true: reductions increase the need for innovation and "force you to automate."

Detailing the management philosophy that saw him through, Linden advised others that might face a similar situation that "if you can save a dollar today, save it."

If you know a function is going to have to be cut, he said, cut it immediately. The dollars saved day by day add up and gain time for management.

"Now, you've got to be right when you make these decisions," he noted. "You've got to be bold and make some decisions."

Loss of Staff

Noting that the same principals apply for staff reductions, Linden reported that EIA "lost some talented people." The DP staff was reduced by 50%. The computer center staff alone went from 52 to 10.

The contractor who helps run the facility, which includes two IBM 3033s and services 200 to 300 on-line users, added only three people to make up the difference. But, Linden said, up-time actually increased slightly and "there was no degradation of the computer facility and the services."

EIA was fortunate, he explained, in that much of its work was handled by outside contractors to whom additional responsibilities could be shifted. However, the agency's contractor budget was also cut. According to Linden, economies were gained by paying closer attention to contractor performance and by using the depressed market for contractor services to obtain greater service concessions.

Systems development work has also been severely curtailed, he said. "We're just not going to change our system every day," he maintained, adding that luckily the present deregulation environment has meant fewer periodic changes are necessary.

Additional Savings

Further cost savings were realized by being stingy with disk space allowances and by getting people to share terminals. In general, people are reportedly doubling up and working harder. "But they don't mind doing it; people are resilient," he said, and will take on more work "if management has a positive attitude."

This is not to say the reduction was without hardship, he continued, especially in the DP department. He decided to cut more DPers than other categories, because DPers would have a better chance to find new jobs than other types of workers.

This did not make him very popular, he acknowledged, noting that as a DPer himself, he was looked on as something of a traitor. "They wanted to shoot me," he recalled.

(Continued on Page 15)

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Ford, Chrysler, AMC Report Major Cuts In DP Operations; GM Refuses Comment

By Tom Henkel
CW Staff

DETROIT — Three of the four top U.S. auto makers — Ford Motor Co., Chrysler Corp. and American Motors Corp. — have reported major cutbacks in their data processing operations. General Motors Corp. refused to comment on what effect the current economic situation is having on its DP operations.

DP operations at the financially troubled Chrysler Corp. were hardest hit by layoffs and cutbacks. Michael H. Seigel, Chrysler's management information system (MIS) director, said DP operations were cut back 50% and four data centers were consolidated into two operations under centralized control.

Manufacturing, sales, finance and parts, which formerly employed separate data centers, have been consolidated into two centers — one for vehicle systems and another for parts systems. This has eliminated some replication of hardware.

Employing a combination of IBM and Amdahl Corp. hardware, the two centers operate with IBM 3033-level technology.

Despite a 50% cutback in personnel, Chrysler's centralized DP effort has actually improved the quality of DP services, Seigel said.

As a result of the cutbacks, the DP department's projects are now evaluated on a six-month basis. Those projects which are considered productivity tools are given the highest priority.

The DP department is allowed two projects which are not productivity-oriented, but they must be rejustified every six months, he said.

For the most part, Chrysler's DP operation has been cutting back both funding and employees at a 15% annual average for the past three years. The funding and scope of some projects, however, have been increased by as much as 20% a year. If all ongoing DP projects are viewed en masse, Seigel said, the DP department appears to be either "breaking even" or operating at a slightly higher level than three years ago.

Despite that appearance, however, Seigel's department does not get special treatment and is experiencing the same severity of cutbacks as other areas in the auto industry, he emphasized.

Cutbacks at Ford

At the onset of hard times in the auto industry — in late 1979 and early 1980 — Ford Motor Co. announced 20% to 25% across-the-board layoffs, which included the DP department. Mayford Roark, Ford's vice-president of MIS, said Ford took a stance similar to Chrysler's: Productivity-intensive projects were maintained and in some cases bolstered, while less significant programs were cut.

Since that big cutback in personnel, Roark said, the DP department has remained relatively stable. Some layoffs were made during 1981, but decreases in DP personnel resulted mainly through failure to replace employees who quit or retired.

"We're looking for a more competitive position through productivity gains," Roark said, adding that the overall list of DP employees has actually increased during 1981 and the early part of 1982.

Unlike Chrysler, Ford does not favor consolidating its DP operation into a centralized site. There are tradeoffs between strong central control and responsiveness to customers, Roark said, and Ford is trying to develop a commonality of hardware within its DP department.

More Contract Programmers

American Motors Corp. has increased its use of contract programmers and packaged software in efforts to combat a frozen personnel budget.

Ron Winecki, head of information systems at AMC, said about 14% of the firm's programming was done by outside sources during 1981; that number is expected to jump to 20% this year.

Like the Ford and Chrysler DP chiefs, Winecki said projects that have a productivity benefit are given priority.

The current situation "is not an extremely bad situation; it requires you to work smarter," Winecki said. Projects that have a short payback cycle are more easily approved than long-term projects. But if it is "a bona fide oportunity, we don't find it difficult" to get funding.

However, the belt tightening at American Motors has had a positive effect too. Because there is not as much money for longer projects, Winecki said his employees have become more efficient in their jobs. They tend to think about details of programs more clearly and waste less time, Winecki said.

American Motors has not been forced to lay off workers in the past 18 months, but there is technically a freeze on overall resources. That compounds the work load for the DP department, Winceki said, because other departments can not hire more people and turn to the DP department to automate things.

"It really hurts when there is a restriction on the [personnel] head count," Winecki said, adding that the DP department has been able to get additional personnel for some projects. For other projects, the firm has had to use contract programmers.

Winceki said that while the contract programmer route gets some needed work done, it is more expensive and gives the DP department less control over its software.

One of the smallest American auto builders, Checker Motors Corp., has also felt the crunch of recession. Pat Alburtus, operations manager at Checker, said the firm has lost two of its seven-man DP staff.

At present, the company does not plan to replace the workers. "We're just struggling," Alburtus said, adding, however, the taxi maker has not cut back the DP budget.

Chrysler's Michael H. Seigel

DPer Tackles Budget Cuts

(Continued from Page 14)

Linden personally contacted several dozen senior executives at private firms and other government agencies to find new positions for his employees and had two people working on this effort full time.

As a result, he said, all but a handful of people found new jobs and the remaining employees gained confidence that if further reductions came, they would be taken care of too.

Planning Important

Linden stressed the importance of planning and acting as soon as possible and of keeping all employees informed of every move. "We didn't hide anything from anybody," he said.

Thus, employees knew they would not suddenly find themselves without a job, but would be informed well in advance and given a lot of help in finding new positions.

The process was not as painless as might be supposed from his description, Linden added. "Half of these people I hired personally." At the time they didn't like what he was doing, "but they now feel I took care of them."

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CONCEPTS FOR MANAGING DATA
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Can't Control Micros, Managers Told

By Brad Schultz
CW New York Bureau

SAN FRANCISCO — Higher management should not try to control personal computing in their organizations because such control is impossible, an Apple Computer, Inc. executive told the Computerweek conference here recently.

Instead, higher management should try to understand the nature and potential of personal computing in business, according to Trip Hawkins, an Apple division product manager.

Hawkins explained that large numbers of white-collar workers will inevitably use personal computers on the job, so managers concerned about effects of such applications should focus on how people with personal computers can contribute more. Management attempts to limit personal computing — by trying to centralize data processing resources — would be as pointless as limiting the personal use of telephones, Hawkins indicated. Personal computers amplify capabilities, extending in short order the range of capabilities a professional can bring to work.

Managers, therefore, face the challenge of overseeing a staff whose capabilities, and perhaps attitudes, have changed swiftly where personal computers have been installed, the Apple executive suggested.

According to Gene Sherman, a vice-president in Xerox Corp.'s Office Products Division, there were three programmers for every computer in 1965. Largely because of personal computing's arrival, there will be five computers for every programmer by 1985, he said. Another factor in this shift is availability of software packages, which replace the need for computer users to write their own software.

Eventually some packages will be so effective, yet user transparent, that users will not require those packages to have documentation, Ed Juge, director of merchandising for Radio Shack, predicted.

In general, personal computer users are showing less need for documentation that explains how their system works or what its components are, than for written explanations of how to operate the system as well as other aspects of interaction with the system, Hawkins declared.

James Finke, president of Commodore International, Ltd., said pricing of personal computers will allow users to justify throwing away malfunctioning devices, rather than have them repaired.

According to Juge, "low-end" personal computers — those now available for less than $1,000 each — will undergo the sharpest price cuts of any personal computer class. The pricing of business-oriented personal computers — which can serve as word processing workstations, remote terminals or data processors — will generally stabilize at present levels, the Radio Shack executive asserted, but commercial users will be able to buy more and more capabilities for the same price.

DPers Must Face Facts

Exec Says Micros Here to Stay

By Robert Batt
CW West Coast Bureau

SAN FRANCISCO — The data processing professional must face the fact that microcomputers are in business organizations to stay, the Computerweek conference was told here recently.

Speaking at an early-bird rap session on "Corporate DP and the Microcomputer Revolution," Harold Kinne, founder of Halkin Computing, Inc., Richardson, Texas, observed that DP managers should also stay in control of emerging microtechnology.

"The small computer exists today in most organizations. They are going to be used by managers who need to be competitive. The DP pro has got to face the fact that personal computers are for real, they are here to stay," he said.

Maintaining Control

Kinne suggested a number of ways in which DPers could maintain control of the micro usage in large corporations:

- A corporation could set up an in-house computer store to sell a company-approved version of a small computer.
- The DP department can approve the use of specific microcomputers and then provide programming and debugging assistance to users.
- The DP department can give desktop computers to managers throughout the corporation.

"Getting control is a big problem for the DP department," he said. Executives are the most frightened people in the world and have surrounded themselves with security devices such as in-trays, out-trays and secretarial services. The DP professional must pierce this protective mentality in order to make sure the correct decisions are made regarding the use of microcomputers, he noted.

Few people really appreciate how far underway the computer revolution is, according to Kinne.

The philosophy of invention has changed dramatically, he argued. In the past, inventions occurred almost as a result of an accident in the laboratory. With the introduction of the microprocessor, he said, "instead of being a laboratory-driven society we are becoming a marketiog-driven society."

Kinne claimed that managers would not be able to compete in the 1980s unless they learned how to use a keyboard. The demand for personal computers in the business world changed dramatically with the introduction last year of the Xerox Corp. 820 and the IBM Personal Computer.

IBM, he estimated, would sell 200,000 microcomputers in the first year of production. This figure is bound by the vendor's ability to produce machines rather than by market demand, he maintained. IBM originally calculated that it would gain a 10% market share in the first year with sales of around 60,000 machines, according to Kinne. But during the first week following the announcement of the IBM Personal Computer, 40,000 machines were sold, he said.

Meet to Examine Focus DBMS Options

WASHINGTON, D.C. — A conference to examine and propose enhancements and features of the Focus data base management system (DBMS) will be held by the Focus Users Group (Fuse) April 4-7 here.

The keynote address, "Technology of the Future: Window on the World" will be given by Gerald H. Ely, chief technology officer for Merrill Lynch, Pierce, Fenner & Smith.

Cost to attend the conference is $200 per person for Fuse members, $250 for nonmembers. There is a $125 fee for spouses. Reservations can be made through Information Builders, Inc., 1250 Broadway, New York, N.Y. 10001.

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Speakers: 16-Bit May Prove Most Volatile Arena

By Brad Schultz
CW New York Bureau

SAN FRANCISCO — Sixteen-bit computing may prove the most volatile arena for DP products and services, speakers indicated at the recent Computerweek conference here. The latest rash of 16-bit microprocessor chips has put microcomputers on desktops with more performance capabilities than IBM 360 mainframes, they noted.

This means processors able to drive sophisticated, development-oriented operating systems — like Unix from Bell Laboratories — are now affordable as personal computers, according to Larry Hartge, marketing vice-president of 3Com Corp., which sells networking software for commercial personal computer users. In fact, Unix and the Xerox Corp. Ethernet local-networking protocols are becoming standards, he claimed, that will greatly influence local net usage in the 1980s.

Unix and Ethernet will be available this year in a number of 16-bit personal computers tagged at less than $6,000, according to recent vendor announcements. Since 16-bit computing has for a decade been the domain of minicomputers, the coming Unix-compatible personal computers will bring considerable computer power to a quite different class of users, Einar Stefferud, independent management consultant, indicated.

Coming to End Users

Unix and Ethernet are coming to end users — people marginally conversant with computer technology but dependent on computer applications in performing their jobs. Why is Unix suddenly so popular?

According to Charlie C. Bass, co-founder and vice-president of Ungermann-Bass, Inc., which manufactures local-net products, Unix is popular because a "generation" of computer professionals — those associated with university computer science departments during the past few years — have found Unix to be the most accessible operating system on campus.

In the 1960s, Bass said, Control Data Corp. largely sewed up the academic marketplace for computer equipment. But Digital Equipment Corp. captured dominance of the same marketplace during the 1970s. DEC mainframes came with serious weaknesses, from the standpoint of research applications, yet more universities in the U.S. support computer science programs with DEC mainframes than mainframes of any other vendor, Bass stated.

To compensate for the operating system weaknesses, however, academic computer scientists have enthusiastically replaced DEC operating systems with Unix, which was developed by Bell Labs. Unix is today the standard operating system for research and development at Bolt, Beranek & Newman, Inc. and other major research and development companies.

Despite the research orientation of most Unix users during the past several years, Unix is coming to the personal computing community, which encompasses a rapidly growing number of business professionals. Digital Research, Inc.'s CP/M has long been the standard operating system for business applications of personal computing, but Unix is moving with the new 16-bit microcomputers to rival CP/M configurations, Bass pointed out.

Nevertheless, either operating system can meet a wide range of business needs, Bass said, so users may have less reason to choose between Unix and CP/M on the basis of a detailed technical comparison than on the basis of what applications software will fit Unix or CP/M.

Bob Metcalfe, president of 3Com and the principal inventor of Ethernet, identified Visicalc — a graphics software package from Visicorp — as the product that established the personal computer as a useful business tool. He told a Computerweek session that a "Visinet" is necessary to establish local networking of personal computers as a useful business tool.

Harry Saal, president and founder of Nestar Systems, Inc., told the session that problems of linking a certain number of personal computers have largely been solved for business applications. Local net developers now focus on problems of linking clusters of personal computers, he said. "Gateway" software has emerged to allow data to pass among different clusters of personal computers over transcontinental packet networks.

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Start Documentation Early, Expert Advises

By Jeffry Beeler
CW West Coast Bureau

SAN FRANCISCO — At what point in the software development cycle should a company begin documenting a proposed new system?

If you think the work should be postponed until the application has already been coded, maybe you should think again.

Ideally, documentation should begin when a development project is just getting under way, according to Stephanie Rosenbaum, president of Tec-Ed Technical Publications and Graphics Services, Inc., an Ann Arbor, Mich.-based consulting firm.

Speaking here at CW Communications, Inc.'a recent Computerweek conference, Rosenbaum urged companies to start documenting new systems as soon as definition of initial software specifications begins. Many firms, she said, wait until a development project has nearly run its course before finally turning attention to the necessary task of writing adequate documentation.

Rosenbaum'a comments apply only to documentation for nontechnical end users. "What I'm talking about here," she explained, "is the type of material that shows people, not how systems can be maintained, but how they can be used."

Constant Modification

Like software, documentation requires constant modifications or updates and thus is forever changing. Therefore, any effort to fully document a system involves a large and continuing expense — so large, in fact, that many companies are often tempted to forego documentation entirely.

But Rosenbaum advised her listeners to resist such impulses and document their systems to the hilf, no matter how high the price. "Documenting a program effectively is very costly — no doubt about it," she said. "But a lack of documentation is even more costly."

Every hour spent documenting a system during its development saves 10 to 100 hours of user time once the application is finally up and running, Rosenbaum said.

The acquisition of manuals, packaged training aids and other varieties of end-user documentation usually takes one of two major forms. Companies either buy the material on the outside or develop it in-house.

The problem with the latter alternative is that it places the burden of documentation writing squarely on the shoulders of an organization's programmers, whose distaste for literary endeavors is usually surpassed only by their ineffectiveness as communicators.

"Programmers are often grossly misplaced as documentation apecialists," according to Intel Corp.'s Computer-Aided Design Systems manager, Dick Gruen, who was one of the speakers in a conference session chaired by Rosenbaum. "Programmers tend to treat writing as programming, and they tend to document a system'a niftiest and most esoteric features rather than the things a user really needs to know."

Copyrighting Focus Of Special Law Issue

LOS ANGELES — A special issue of the *Computer/Law Journal* focusing on copyright protection for computer software has been published by the Center for Computer/Law. This issue explores unresolved topics remaining from the passage of the Computer Software Copyright Act of 1980.

The issue includes articles on whether the new legislation preempts trade secret protection for software that is copyrightable and copyrighted and copyright protection for object code.

The price of the issue is $18 if purchased in North America, $19 elsewhere. Single copies are available from the Center for Computer/Law, Box 54308 TA, Los Angeles, Calif. 90054.

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DP Called 'Sick Adolescent'

Execs: Programmers Are Overpaid, Immature

By Marcia Blumenthal
CW Staff

SAN FRANCISCO — Programmers are overpaid, immature employees whose jobs, for the most part, could be eliminated.

Despite constant warnings in the trade press of severe programmer shortages, the demand for programmers can be slashed, according to Thomas J. Francl, president of TIF Enterprises, an Arcadia, Calif.-based DP consulting firm.

With software tools available today, the end-user department can create 50% of an application, and with the aid of microcomputers, users can develop 90% of the applications, Francl told a group gathered here recently for the Computerweek conference.

"DP is a sick adolescent," Francl maintained. The symptoms are backlogs, missed commitments and high turnover rates as programmers jump ship for higher paying jobs at other companies.

Because programmers are in short supply they have companies over a barrel, but aggressive end-user departments are not going to stand for this much longer and will begin to wrest control of information away from DP professionals, he said.

Programmers have little loyalty to their companies and are motivated by money, observed Charlene Francl, assistant vice-president at Security Pacific National Bank. As part of her graduate degree, she studied programmers' motivations and found money to be the primary motivator.

In addition, programmers are self-centered and "tend to act like children." Managing programmers is sometimes "like running a day care center," she asserted. Because of shortages, programmers are often paid far above salary levels for other professionals, she said, noting that in many cases they make more than assistant vice-presidents at banks.

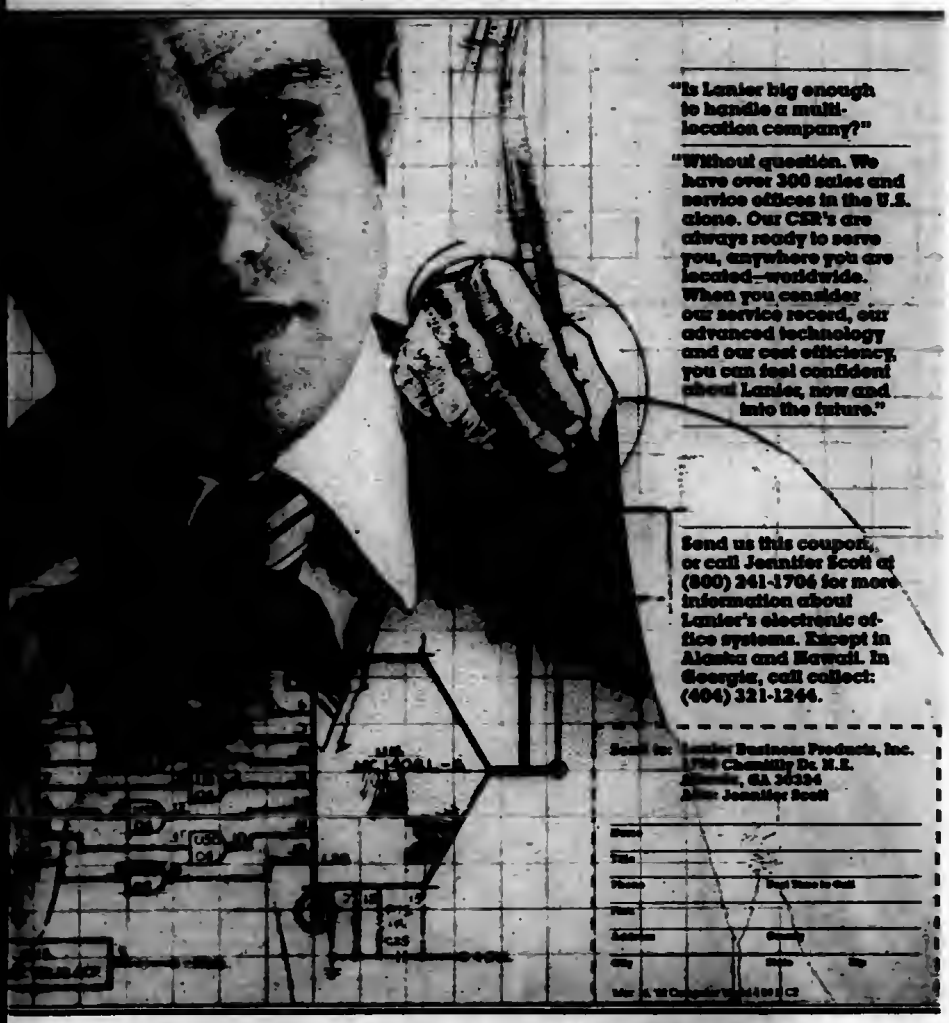
Solutions that are designed to keep the programming staff happy are really responses to a supply-side mentality, Thomas Francl noted. Rather than continuing to feed into the shortage mystique, he suggested companies should find ways of reducing demand for programmers.

This could be done by eliminating the DP department as it exists today. DP managers should be the catalysts for this process by restructuring their departments — moving DP professionals out to end-user departments.

Moreover, President Francl called for the deprofessionalization of programmers. "What a business needs is more analysts — not systems analysts, but general analysts — that have a business orientation."

Companies don't need a lot of overly technical computer science majors or highly- trained programmers. What companies require are more business majors trained to be problem solvers, he said.

"A bigger commitment."
Joe Sensat, National Service Manager, Electronic Office Systems Division



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SAN FRANCISCO — An international conference on computer capacity management will be held here April 19-22 by the Institute for Software Engineering. The conference will focus on what needs to be done to manage computer capacity and will present both managerial and technical points of view.

Besides other sessions and panel discussions, three tutorials will be offered beginning April 19. A full-day tutorial will focus on management's point of view on how to plan for capacity management growth. The second full-day tutorial will look at analytical modeling techniques to explain basic queuing models for predicting performance quantities of throughput and response times.

A half-day tutorial will discuss the integration of corporate plans and data processing requirements.

The registration fee for the conference is $345, which includes attendance to all sessions, three luncheons, two cocktail parties and a copy of the proceedings. The full-day tutorials cost $110 and the half-day tutorial costs $85.

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Manager: DPers Capable Of Changing Their Roles

By Robert Batt
CW West Coast Bureau

SAN FRANCISCO — DP professionals have the power to transform the quality of their working lives within organizations.

That claim was made by Donna Filippello, manager of employee relations at Levi Straus & Co., during the Computerweek conference held here recently.

Speaking at a session on "Building Careers in DP," Filippello said that as a united professional group DPers could make changes in their companies and benefit their own careers.

However, she warned, it was up to the technical professionals to take the responsibility and to come up with solutions to their career problems.

One way in which this could happen, she said, is to press for horizontal as well as vertical growth paths. Singular career paths that only allow for growth via upward promotion are a major barrier to a DPer's growth prospects.

"American industry, including Levi Straus, has a pronounced tendency to overstructure," she said. "We prepare elaborate organizational charts and then we try to fit people into these little boxes. The result is that job descriptions bear no reality to the actual job being performed."

Filippello argued that choosing companies with alternative career paths would make organizations aware of how seriously DPers perceive their career needs. Many firms, she claimed, are just asking for heavy staff turnover because they provide training without opportunity for growth. This only leads to employee frustration, she maintained.

Terri Davis, DP staffing specialist at San Francisco-based Foremost-McKesson, Inc., agreed with this view. "You need to give DP professinals some variety and the feeling that they are in control of their own destiny."

Companies must ensure that DPers' skills keep pace with advances in technology so that management information systems department personnel do not become obsolete, she warned.

In addition, she said, there is a good case to be made for having a DP performance appraisal system that is separate from that used for other company personnel. This would give the appraisers a means of assessing a person's performance against factors that are unique to the computer industry, Davis said.

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Consultant Sees Focus on Skills Means to Promoting Job Growth

By Robert Batt
CW West Coast Bureau

SAN FRANCISCO — The need for an institutionalized approach to personal career development was also addressed during the session on "Building Careers in DP" at Computerweek held here recently.

Janet Bensu, a consultant and former manager at Levi Straus & Co., maintained that an organization's structural design should promote growth and movement.

"Traditionally we have looked at organizations in a very linear way. We never looked at the responsibilities and tasks involved in each job and so we have people doing lots of different things but calling these jobs by the same name. We are not taking into account these people's own growth," she said.

The answer to this problem, according to Bensu, is to specifically define the tasks and skills needed to perform successfully in a given position. "It is by identifying and focusing on skills that we can improve performance and think about the kinds of training that will be required."

Skills are the central element around which career development plans can be built, she argued. "When we have such job descriptions we have an objective way in which to help people move towards their desired goals," she added.

But there is far too much stress on knowledge-based skills including technical expertise and not enough on other needed skills such as human relations and the ability to implement plans, Bensu warned.

This is the major reason why so many DP pros either fail to become managers or make relatively poor ones, she claimed.

"When we select a manager and we don't train them in these skills, we are putting them on the firing line and setting them up to fail," she said.

Front line DP management is, according to Bensu, the most difficult management position because it requires interaction both with the ranks of technicians who are former colleagues and with high-level managers who make strategy decisions.

"We simply don't train our project managers to accurately represent company philosophy. Yet these front line managers are 'the company' for the many people they have under their control. The result is that there is a lot of dissatisfaction among employees. They are poorly communicated with and this leads to frustration," Bensu said.

'He Considers Himself *The Virtuoso* Programmer.'

How Does One Prioritize Projects?

Q I am one of six project managers in data processing. The last couple of years have been extremely frustrating for all of us because project priorities are continually changing. Just as we build momentum on one project we are told to drop everything to work on another "hot" project.

We set up project schedules based on availability of resources and resource commitments at a given point in time. Needless to say, our adherence to project schedules is almost laughable.

My manager has no say in priorities and those above him cannot make up their minds on what they want. The situation is getting out of hand. Any suggestions?

A Your manager should work with appropriate high-level functional area managers (i.e. the information systems steering committee) to establish guidelines for the enhancement and development of business systems.

Although there is no set of guidelines applicable to all companies, the following guidelines may be of some help. These were compiled by managers from diverse organizations:

1. If the system fails, fix it.
2. Government regulation or legal requirement.
3. Required for significant corporate decisions.
4. Contribution to corporate profit (savings or earnings).
5. Intangible benefits.

It should be emphasized that these are guidelines and not rules. There will inevitably be exceptions, but at least the exceptions will be assessed within a framework.

Q The plant manager has asked me to look into the purchase of a small computer that will be dedicated to plant applications. Vendors of both microcomputers and minicomputers have assured me that their systems would meet our needs. Exactly what is the difference between a micro and a minicomputer? Is it possible for both to meet the same requirements adequately?

A The essential components of a computer system are embodied in the smallest business computer systems. From an applications standpoint, there are microcomputers that can run circles around minicomputers. On the other hand, so-called minicomputers have decreased in size and cost to become competitive with micros.

Some people have used word size to distinguish between micros and minis. Others have used processor architecture, memory size, cycle time and even physical size. These distinctions are no longer valid.

To avoid further confusion, I have adopted a simple computer classification scheme that I hope will withstand the test of time. The categories are small, medium and large. All micros and minis fall in the first category.

Q My background consists of maintenance and development Cobol programming. For the last year-and-a-half I have been working in the area of problem and change management and have helped to develop and implement problem and change management functions.

However, I realize this is only a small part of the systems management field. Because of this, I would like to know: (1) what future there is for someone working in this area (problem and change management) of systems management and (2) should I concentrate on expanding my knowledge of the entire discipline of systems management?

In addition, I would like to know why there have been few, if any, position announcements for individuals working in systems management? Is the concept of systems management a recent development?

A The term "systems management" evolved with the increasing complexity of systems after World War II, but never really materialized as a separate career path. The principles of systems management should be part of any manager's arsenal of management tools.

You cannot disassociate problem and change management from the basic precepts of management, especially in the computer/information systems area.

A knowledge of the considerations and approaches to systems management is valuable, but the vast majority of organizations are looking for managers with skills to cope with all facets of the DP environment.

Long is a professor at Lehigh University, a DP consultant and author. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, P.O. Box 880, Framingham, Mass. 01701.

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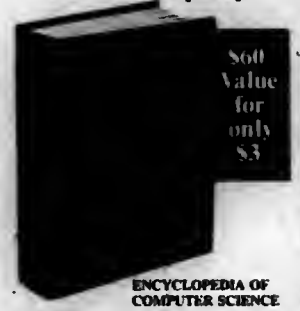

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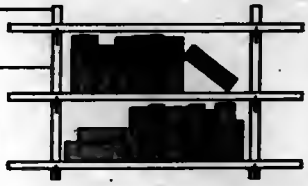

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By Donald D. Spencer

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Paperback, 157 pages, $16.95 from Jerry Fitzgerald and Associates, 506 Barkenting Lane, Redwood, Calif. 94065.

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The computer business is reaching a point in its life span when books chronicling its events begin to appear. This is the first biography on a single person and may well set an example for others to follow. Austrian portrays Hollerith with care and sensitivity, based on family memoirs and information provided by IBM (the author is an editor of their *Think* magazine). Hollerith was not a fascinating personality — he was frugal, conservative, enjoyed the simple pleasures of food and creature comforts — but he was a first-rate inventor who profoundly influenced automation. Hollerith's first job, at 19, was working on the 1880 census. When he sold his Tabulating Machine Co. to C-T-R (which later became IBM) in 1911, just 32 years later, he was a millionaire.

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Bache Exec Predicts Bright Future for Robotics

By Bruce Hoard
CW Staff

DETROIT — Start-up companies entering the incipient robotics industry have garnered some $25 million over the past two years, Laura Conigliaro told some of the more than 30,000 attendees at the Robots VI Conference and Exposition here recently. "There must be a great deal of hope and not just wishful thinking that these companies will be successful," the vice-president of the research department at Bache Halsey Stuart Shields, Inc. said.

The show was sponsored by the Robotics International of the Society of Manufacturing Engineers and the Robot Institute of America.

Conigliaro predicted the intense competition among manufacturers in the industry will lead to a shakeout of "marginal companies," adding, "This is one tough market." Small and large companies alike must be extremely solicitous of customers if they hope to survive the shakeout, she said.

Conigliaro cited the impact of recent licensing agreements that have brought such companies as General Electric Co., Westinghouse Corp. and Bendix Corp. into the marketplace. The firms made the outside deals because "you can't turn out robots like cookies."

The entrance of these large companies will immediately give the industry more visibility in areas other than automotive, which absorbed more than 40% of robotics sales in 1981, Conigliaro claimed. The agreements will also accelerate the trend toward new applications, she added, noting some new robots do not even offer spot welding, the most popular application to date.

The GEs, Westinghouses and Bendix will use the technology of their license partners to amass the expertise needed to develop and market their own robots, she commented.

Conigliaro said the robotics industry is comprised of far more than just vendors. Other elements include manufacturers, consultants, systems companies and analysts. This "tremendous infrastructure" is an indication that more than robots are at stake.

Computer-aided manufacturing (CAM) is what the robotics revolution is really all about, she said. Along those lines, there will be a tier system including integrated systems manufacturers, integrated systems suppliers and robot manufacturers and vendors.

"Robots will be a portion of a higher hierarchy," Conigliaro said.

The average price for a robot now is $70,000, but it is expected to drop as systems prices go up. There are four price/performance options manufacturers can embrace. The first is constant price with increased performance. Such a plan has worked well for minicomputer manufacturers, she observed.

The second option is to maintain constant function while reducing price, a strategy requiring the sales force to sell twice as much to stay even, she said.

Thirdly, robot manufacturers may offer a lower price and reduced functions. It is difficult to determine which of those two to drop and by how much, she explained.

The final of the four options is to ask for a higher price while offering higher functions, a plan that can induce competitors to follow upward in a willy-nilly fashion, Conigliaro commented.

IBM Unveils One-Armed Robot

BOCA RATON, Fla. — IBM broke into the rapidly expanding industrial robotics marketplace with the recent introduction of a one-armed robot programmable with the IBM Personal Computer.

The 7535 Manufacturing System is programmed with the AML language and is said to automatically assemble, pack, load and unload parts with "repeatable precision."

The system consists of a controller with an operator panel and a servo-controlled jointed arm capable of moving in four different directions.

The robot will be built to IBM specifications by Sankyo Seiki Manufacturing Co. of Tokyo.

It costs $28,500 and will be available in the fourth quarter of this year, IBM said.

Usus Group to Meet June 25-27 in Boston

BOSTON — The semiannual meeting of the University of California at San Diego P-Systems Users (Usus) group will will be held here June 25-27.

The meeting will include programming tutorials, product announcements and demonstrations.

Preregistration fees must be received by June 1 and are $25 for members and $35 for nonmembers. Registration at the door will be $35 for both members and nonmembers.

More information is available from Usus, P.O. Box 1148, La Jolla, Calif. 92038.

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Expert Advises Ways to Ease Robot Installation

By Bruce Hoard
CW Staff

DETROIT — The installation of industrial robots can cause damaging conflicts unless an organization moves to prevent them before they happen, organizational psychologist and consultant K. Shaw Felsing said at the Robots VI Conference and Exposition here recently.

Speaking to an audience of approximately 600 at a session on robotics justification, she described the barriers to robot implementation and prescribed guidelines for avoiding them.

Like other conference speakers, Felsing noted the impediments to robotics implementation caused by lower and middle managers, who bear the brunt of production changes. Top management tends to think that spending large sums of money on new equipment means that lower level managers will take the equipment to heart, she said.

Ill-Concelved Plans

All ill-conceived robotics implementation can engender feelings of inferiority, obsolescence, confusion, fear and remoteness among workers, Felsing said.

The people/person-type middle manager can also suffer a unique set of worries including how fast can the robots be repaired and how can he tell when they are not working correctly? Beyond that, he may be insecure because he knows less about the robots than the technicians and is uncertain if increased gains in productivity are offsetting the initial capital investments, she noted.

Turning to solutions, the consultant said top management can preclude many such problems by targeting areas of potential conflict well before implementation and negotiating them with the departments that will be affected.

Preliminary Phase

She described a preliminary phase consisting of the "techno-economic approach" and the "human-dynamics approach."

The former consists of four basic steps for top management, which must:

- Familiarize itself with the differences between the old and the new technologies.
- Clearly understand the purpose and components of the new production process.
- Develop well-defined objectives for the new equipment.
- Design the system's operation from beginning to end.

Human dynamics must also be taken into consideration during the preliminary phase, Felsing explained.

Most Critical Period

The most critical period is the time when the robots have been installed and are just starting operation.

"Be open with the most honest information the company has," the organizational psychologist advised, because employee fears will have to be dealt with eventually, anyway.

Her "educational program" called for comprehensive, daily communication between all company employees involved with robotics implementation and use.

A post-installation status report should contain daily updates of the new implementation and should be circulated from around two weeks before until two weeks after it begins work.

The post-installation status report and management discussions are the most critical elements of the educational program because they serve as "monitoring mechanisms to tackle problems before they develop," she said.

Lastly, a system productivity report should be issued during the same time period.

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March 31, Capri, Italy — **Software Factory Experiences.** Contact: SRI International, 333 Ravenswood Ave., Menlo Park, Calif. 94025.

April 4-7, Chicago — **Access '82.** Contact: Deltak, Inc., 1220 Kensington Road, Oakbrook, Ill. 60521.

April 5-7, San Francisco — **The Office Automation Conference.** Contact: American Federation of Information Processing Societies, Inc., 1815 N. Lynn St., Arlington, Va. 22209.

April 5-8, Los Angeles — **Data Base Design.** Contact: Information Methods (USA) Corp., 504 Totten Pond Road, Waltham, Mass. 02154.

April 5-9, New York — **IMS/VS Data Base Design.** Contact: I. Zelin, Comped, 1133 Ave. of the Americas, New York, N.Y. 10036.

April 5-9, Piscataway, N.J. — **CICS/VS Command-Level Applications Programming.** Contact: I. Zelin, Comped, 1133 Ave. of the Americas, New York, N.Y. 10036.

April 5-9, Chicago — **Fundamentals of Computer Analysis and Design.** Contact: American Management Associations, 135 W. 50th St., New York, N.Y. 10020.

April 5-9, Washington, D.C. — **James Martin Seminar.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

April 6-7, New York — **Systems Network Architecture.** Contact: The DMW Group, Inc., Publishing & Seminars Division, 2020 Hogback Road, Ann Arbor, Mich. 48104.

April 14-16, Atlanta — **Basic: A Computer Language for Managers.** Contact: American Management Associations, 135 W. 50th St., New York, N.Y. 10020.

April 15-16, Los Angeles — **Developing Documentation.** Contact: Carnegie Press, Center for Documentation Resources, 100 Kings Road, Madison, N.J. 07940.

April 15-16, New York — **IMS Data Communications.** Contact: Chubb Institute Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

April 15-16, Philadelphia — **Capacity Planning.** Contact: Sondra Schwartz, Boole & Babbage, Educational Services Division, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

April 15-16, San Francisco — **Ada.** Contact: Education Foundation of the Data Processing Management Association, Department ADA, P.O. Box 91295, 5959 W. Century Blvd., Los Angeles, Calif. 90009.

April 16-17, Fargo, N.D. — **15th Annual Small College Computing Symposium.** Contact: Sandy Sprafka, North Dakota State University, Computer Center, Fargo, N.D. 58105.

April 16-17, Blacksburg, Va. — **12th Annual Virginia Computer Users Conference.** Contact: Deidre Maskaleris or Wesley Braudaway, 562 McBryde Hall, Blacksburg, Va. 24061.

April 17, San Francisco — **JCL and Utilities Workshop.** Contact: Expertise Extension Workshop, 220 N. Glenoaks Blvd., Burbank, Calif. 91502.

April 17, Los Angeles — **IMS/VS ADF (OS/VS).** Contact: Expertise Extension Workshop, 220 N. Glenoaks Blvd., Burbank, Calif. 91502.

April 17, Los Angeles — **CICS/VS Command Level Workshop.** Contact: Expertise Extension Workshop, 220 N. Glenoaks Blvd., Burbank, Calif. 91502.

April 18-21, Dearborn, Mich. — **Expo '82.** Contact: Numerical Control Society, 519 Zenith Drive, Glenview, Ill. 60025.

April 18-22, Miami — **Common, An IBM Computer Users Group.** Contact: David G. Lister, Administrative Director, Common-F82, 435 N. Michigan Ave., Chicago, Ill. 60611.

April 19, Boston — **Management Overview of Data Structured.** Contact: Jim Highsmith, Ken Orr and Associates, 715 E. 8th, Topeka, Kan. 66607.

April 19, Boston, — **Computer Graphics in Architecture & Engineering.** Contact: George Borkovich, 3400 Edge Lane, Thorndale, Pa. 19372.

April 19-20, Chicago — **Multivendor DC Networks Planning, Perspectives and Strategies.** Contact: Q.E.D. Information Sciences, Inc., Q.E.D. Plaza, P.O. Box 181, Wellesley, Mass. 02181.

April 19-20, New York — **Word Processing Implementation Workshop.** Contact: National Institute for Management Research, P.O. Box 3727, Santa Monica, Calif. 90403.

April 19-20, Williamsburg, Va. — **Successful Software Management.** Contact: Data Processing Management Association Education Foundation, P.O. Box 91295, Department SSM, Los Angeles, Calif. 90009

April 19-20, San Francisco — **How to Manage Data and Information as a Resource.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md., 20954.

April 19-20, Denver — **Open Systems Interconnection With X.25 and Other Related Protocols.** Contact: McGraw-Hill Conference & Exposition Center, 1221 Ave. of the Americas, Room 3677, New York, N.Y. 10020.

April 19-20, Chicago — **Fundamentals of Data Processing and Telecommunications.** Contact: National Institute for Management Research, P.O. Box 3727, Santa Monica, Calif. 90403.

April 19-20, Washington, D.C. — **How to Achieve Information Re-**

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sources Management. Contact: Information Resources Management Associates, Inc., Box 40795, Washington, D.C. 20016.

April 19-20, San Francisco — **How to Plan Your Resources for Central File Conversion.** Contact: Innovative Systems, Inc., 341 Fourth Ave., Pittsburgh, Pa. 15222.

April 19-20, Chicago — **Word Processing II.** Contact: National Institute for Management Research, P.O. Box 3727, Santa Monica, Calif. 90403.

April 19-20, Boston — **Developing Documentation.** Contact: Carnegie Press, Center for Documentation Resources, 100 Kings Road, Madison, N.J. 07940.

April 19-20, San Diego — **Ada.** Contact: Education Foundation of the Data Processing Management Association, P.O. Box 91295, 5959 W. Century Blvd., Los Angeles, Calif. 90009.

April 19-20, New York — **Word Processing Implementation Workshop.** Contact: National Institute for Management Research, P.O. Box 3727, Santa Monica, Calif. 90403.

April 19-21, Chicago — **Telecommunications Management.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

April 19-21, Cherry Hill, N.J. — **Programming in Basic.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

April 19-21, Chicago — **Distributed Data Processing: A Management Update.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

April 19-21, Washington, D.C. — **Data Base Management Systems: General Concepts and Guidelines.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075

April 19-21, Washington, D.C.— **DL/1 Application Programming.** Contact: Data Base Management, Inc., 281 Hartford Tnpk., Vernon, Conn. 06066.

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April 19-21, Dallas — **Data Processing: Fundamental Concepts.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran N.J. 08075.

April 19-21, San Francisco — **DP Project Management: A Practical Approach.** Contact: Seminar Department, Datapro Research Corp., Delran, N.J. 08075.

April 19-21, Chicago — **Fundamentals of Data Processing for the Non-Data Processing Executive.** Contact: American Management Associations, 135 W. 50th St., New York, N.Y. 10020. Also being held in New York, April 19-21.

April 19-21, Chicago — **Data Security Implementation and Management.** Contact: Seminar Department, Datapro Research Corp., Delran, N.J. 08075.

April 19-22, Houston — **IMS/VS Application Development Facility.** Contact: Data Base Management, Inc., 281 Hartford Tnpk., Vernon, Conn. 06066.

April 19-22, San Francisco — **The Fourth Annual International Conference on Computer Capacity Management.** Contact: Institute for Software Engineering, Suite 200, 535 Middlefield Road, Menlo Park, Calif. 94025.

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April 19-22, New York — **Vsam Using Access Method Services.** Contact: I. Zelin, Comped, 1133 Ave. of the Americas, New York, N.Y. 10036.

April 19-23, Minneapolis — **Structured LSI/VLSI Design.** Contact: Custom Integrated Cicuits, Suite 603, Park National Bank Building, 5353 Wayzata Blvd., Minneapolis, Minn. 55416.

April 19-23, Boston — **Data Base Concepts and Design.** Contact: American Management Associations, 13 W. 50th St., New York, N.Y. 10020.

April 19-23, Boston — **James Martin Seminar.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

April 19-23, Rochester, N.Y. — **Structured Analysis Workshop.** Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y 10011. Also being held in St. Louis, April 19-23.

April 19-23, Atlanta — **Structured Analysis/Design Workshop.** Contact: Structured Methods, Inc., 7 W.

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April 19-23, Washington, D.C. — **Computer Communication Systems and Networks.** Contact: Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

April 19-23, San Francisco — **Software Maintenance.** Contact: Lee Heilakka, Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011.

April 19-23, Ann Arbor, Mich. — **The Programmed Learning Workshop.** Contact: Maggie St. Clair, Program Assistant, The University of Michigan, Division of Management Education, Graduate School of Business Administration, 1735 Washtenaw Ave., Ann Arbor, Mich. 48109.

April 19-23, Lake Tahoe, Nev. — **Structured Requirements Definition.** Contact: Jim Highsmith, Ken Orr and Associates, Inc., 715 E. 8th, Topeka, Kan. 66607.

April 19-23, New York — **8100 DPPX Applications Analysis and Design.** Contact: Data Base Management, Inc., 281 Hartford Tnpk., Vernon, Conn. 06066.

April 20, Washington, D.C. — **Management Overview of Data Structured Systems Development.** Contact: Jim Highsmith, Ken Orr and Associates, Inc., 715 E. 8th, Topeka, Kan. 66607.

April 20, Washington D.C. — **Accessing and Utilizing Public Data Bases.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

April 20, Washington, D.C. — **Evaluating and Selecting Computer Software Packages.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

April 20, Columbus, Ohio — **Computer Fraud and Security.** Contact: Workshop Office, Lower Level, Memorial Auditorium, Ohio University, Athens, Ohio 45701.

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April 20-22, Sunnyvale, Calif. — **Systems Network Architecture.** Contact: Telecom Computer Technology International, Inc., 599 N. Mathilda Ave., Sunnyvale, Calif. 94086.

April 20-22, Chicago — **Basic: A Computer Language for Managers.** Contact: American Management Associations, 135 W. 50th St., New York, N.Y. 10020.

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April 20-23, Birmingham, England — **Communications '82.** Contact: Kallman Associates, 5 Maple Court, Ridgewood, N.J. 07450.

April 21, Chicago — **Computer Graphics in Architecture & Engineering.** Contact: George Borkovich, 3400 Edge Lane, Thorndale, Pa. 19372.

April 21-23, Atlanta — **Data Communications: An Introduction to Concepts and Systems.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

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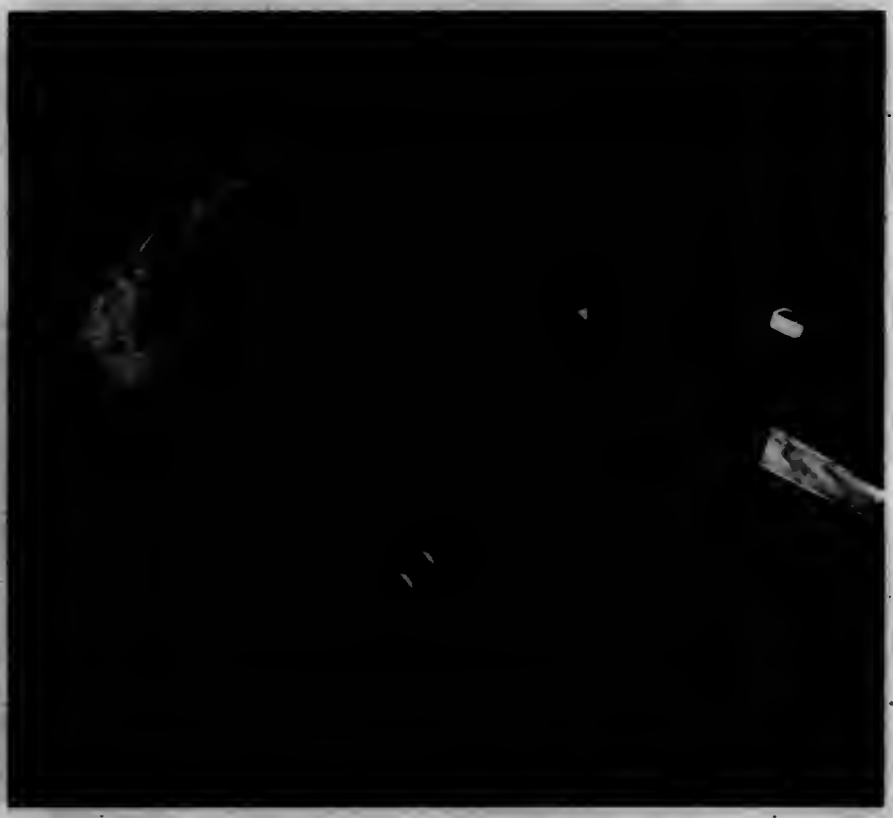
April 21-23, San Francisco — **How to Manage Data and Information as a Resource.** Contact: Barnett Data Systems, 18 Orchard Way N., Rockville, Md. 20854.



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EDITORIAL

Not a Pretty Picture

John Thompson does not paint pretty pictures.

The vice-president of the Cambridge, Mass.-based consulting firm Index Systems, Inc., and keynote speaker at Computerweek two weeks ago laid out in painful detail the "organizational swamp" of new technology, changing business requirements and mounting demands from top management that has ensnared DP managers in small and large companies alike.

From management's point of view, pressure on the organization for increased earnings is intense, competition is fierce, inflation is a constant threat. "Things are tough out there," Thompson said. "It isn't fun anymore trying to make money."

Management wants to know how data processing technology can help solve these strategic business problems, but frustration toward DP in the executive suite is at an all-time high. Why, executives ask, when high technology is the only industry in the country that is working well can't it work in their business? "The technological fix is the thirst we see in management across corporate America today," Thompson said, "because it's the last option."

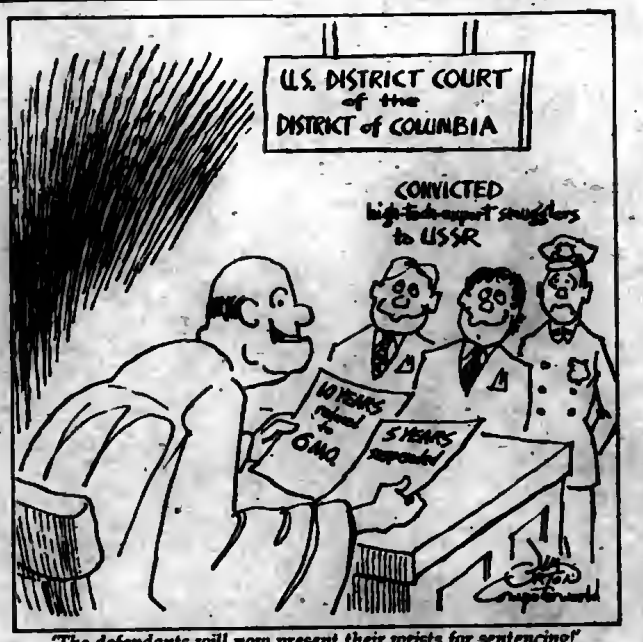
But DP executives have their own problems. They are running application software systems that are eight to 10 years old; they face an average two-year backlog of work with priorities set by the user steering committee; they feel alienated from the senior management decision-making process; their relationship with end users is not good.

So while he should be thinking about the strategic use of technology to support the business goals of the company, all the average DPer can really think about is programmer turnover, project risk, old system replacement — "all the things he does during the week to get things back by Friday evening to the way they were on Monday morning," in Thompson's words.

Result: The "culture gap" between management and DP is widening at the precise moment when what Thompson calls the "second wave of the computer revolution" is crashing down on DP. The second wave is a transitional period laden with stress and turmoil during which the cost/benefit push gives way to the user pull of "give me back my data," transaction processing evolves into management support and data processing becomes information resource management.

Thompson believes the angle of nonalignment between what a company is trying to do and where the DP momentum is taking it must be narrowed. Such a move requires that business management understand what they can and cannot expect from DP and what guidance they can give to help DP support the business better. Likewise, DP must be prepared to enlighten top management about how its systems can support the overall business objectives.

The need, according to Thompson, is to bring business and DP professionals back together "to create the notion of truly exploiting information systems technology for the good of the corporation."



'The defendants will now present their wrists for sentencing!'

LETTERS

'Superior Coverage'

I would like to take this opportunity to commend *Computerworld*'s superior coverage of the SAS Users Group International (Sugi) conference [CW, Feb. 22].

We found the reporting to be totally accurate, yet thoughtful — concise, yet in-depth.

In the cover story "Spotlight Truly on Users at SAS Users Meet," the writer pointed out that "it was the users in the limelight," and the stories that followed supported her observation.

The writer reported on the users — their applications, their innovations and their interactions with each other.

James H. Goodnight
President
SAS Institute, Inc.
Cary, N.C.

Valuable Tool

One of the most valuable tools available to the data processing staff of a college or university gets little publicity.

I was, therefore, pleasantly surprised by "Illinois School to Host the Cumrec" [CW, March 1] telling of the Collegs and University Machine Records Conference (Cumrec) May 2-5 meeting in Chicago.

My only reservation is that your headlins would not attract the attention of those who are not familiar with Cumrec.

While many of us in this field do know Cumrec — I've attended since 1969 and have always gotten more than my money's worth — there are still too many who don't.

Let me urge any postsecondary institution that has not sent a representative to Cumrec to get this year's program and seriously consider having someone attend.

The contact with colleagues from 600 or more institutions and the well-presented papers make Cumrec a most valuable opportunity for learning, sharing and "battery recharging."

D.S. Owings
Director
Pratt Computer Resources
Pratt Institute
Brooklyn, N.Y.

Security Breach?

I would like to comment on Guy L. Jones' letter to the editor on the subject of systems operators being ignored [CW, Jan. 25].

I might agree with Jones that some view computer operators as dumb animals who can only push buttons, but I strongly disagree on his view of what a good operator can do.

If I found operators debugging programs, I would severely object to this practice as well as question the management that would allow this.

I am not saying that operators are incapable, just that this is a direct breach of any security and controls that may have been set up.

John L. Cotton
DP Auditor
Legislative Audit Bureau
State of Wisconsin
Madison, Wis.

Computerworld welcomes comments from its readers. Preference will be given to typed, double-spaced letters of 150 words or less. Letters may be edited for purposes of brevity and clarity. Letters should be addressed to Editor, *Computerworld*, 375 Cochituate Road, P.O. Box 880, Framingham, Mass. 01701.

DATA PAST

Five Years Ago
March 28, 1977

NEW YORK — Judge David N. Edelstein upheld Itel Corp.'s charges that IBM attorneys harassed and intimidated it to obtain documents for the U.S. vs. IBM antitrust trial.

Edelstein denied a motion by IBM requesting further production of internal Itel documents "in light of the conduct of counsel for IBM."

Ten Years Ago
March 15, 1972

SAN FRANCISCO — The temporary restraining order requiring IBM to continue maintenance for users with extended memory equipment from Itel Corp. was extended until the end of the court proceeding in which Itel was asking for a preliminary injunction barring IBM from withdrawing maintenance services.

SOFTLINE /Werner L. Frank‡

Data Management Systems: Focusing on the User

Data processing users are besieged with a variety of software to meet the need for better tools in implementing applications. The most common offerings are data management systems suitable for ad hoc or prototyping use in generating a solution to a computer problem.

These systems, in increasing numbers, are now also becoming available on popular desktop computers for personal and professional use.

Vendors of data management systems make an hoonest effort to focus on the ultimate user's needs. However, the starting point and perspective for the design of these products are too often those of the computer and the data processing professional.

Hence, the concerns are directed toward the technical aspects of file design, data structure and data networks, search and retrieval logic, report generation options and the whole area of data base maintenance and support.

User Satisfaction

How well do these professionally oriented functions really satisfy the user? Only the user can respond and so, in that guise, we propound the following criticisms and suggestions for improvement of commercially available data management systems, especially those offered for popular microcomputers.

We start by citing the most prominent irritant and oversight of commonly available data management systems. This is the lack of ability to redefine and reconstruct a file definition and the associated data file when the user discovers, after file definition is complete, that some data element is missing.

Unfortunately, the user must often rebuild an existing file unless he employed the inelegant foresight of including dummy fields in the originally defined file.

A corollary to this limitation is the lack of ability to modify a field size or type when it is found that the number of numeric positions is insufficient or a field must be converted from a numeric to an alphanumeric category.

Data management system designers seem to have a one-way focus when it comes to data base construction.

Too often the assumption is made that data bases start from nothing and build up incrementally. Modest record maintenance capacity is, of course, provided through the ubiquitous record delete function. But what is sorely needed is a global maintenance operator that can, via a command-level function, perform operations on an entire file. In this way, families of records can be modified according to some logical selection.

Take the simple example of a file maintaining annual sick leave data that must be reset to zero once every 12 months. Can the system do this in a simple way or must one annually rebuild the file from scratch or modify each record sequentially?

Now those systems that do possess global commands generally limit the operations to one field at a time. But, to maintain data that is the basis for generating moving averages or cyclical computations, further sophistication is desired. What is needed is the ability to shift field-values within a record from one field to another.

For instance, this feature would provide, in the case of 12-month history data, the means of moving data covering 11 months from fields two through 12, one field position each to the left and opening up the 12th field for current-month input.

Operations on fields within a record is often not enough. It also would be nice to have some functions that operate on two successive records, ordered according to the output sequence. This would be useful for generating year-to-date sums and would make it possible to have a column that shows successive change in a variable.

Next, consider the typical situation with respect to a string search. Most systems limit such a search to exact matches or, possibly, a match against a number of leading characters, which is, in essence, a match on a prefix.

Of course, some systems allow for a floating set of characters so that the specific search key will establish a hit no matter where the indicated sequence of characters are located in the field under review.

However, if a system goes that far, why doesn't it go just one step further and allow some wild-card capability? This feature, incidentally, would create a general purpose, template-like capacity for extracting data.

Why can't the output of a data management system automatically provide the query statement along with the printed report? Because modern retrieval systems provide dynamic screen-based interaction.

The query, once entered, is lost in the bits of the machine. There are too many times when the user forgets the question for which he now possesses a bountiful answer.

While on the subject of output, we go on record for a few other desirable features that would make life easier for the user. Many times a user is making a query because he intends to include the response in a record that goes beyond his own desk. Hence, format is important.

Minimum Requirement

Certainly, a minimum requirement is to have some control over page size and layout. It would also be nice if there were a means to overcome the physical limits of paper or screen width. But more essential is the ability to control output field format, especially with respect to quantities carrying many decimal positions.

Now it is often argued that simple, user-friendly systems should not incorporate too many complicating features since this would get one back to complex operations or even procedural programming. We are not, for

(Continued on Page 38)

HUMAN CONNECTION /Jack Stone‡

Human Perspectives Key to DP/User Relations

This is Part 5 of a continuing series on new users learning to cope on the job.

The training of user managers in business systems basics has always been a tough proposition, so when we DP trainers come up with what seems to be a successful program, we like to stick with it.

The five-day, 30-hour "Computer Literacy" program that I occasionally present to the U.S. International Communications Agency (ICA) officers and managers was considered to be a good one.

Its design goals were thoughtfully studied and agreed to by both the ICA training people and the DPers, and the wisdom of their efforts has been borne out by its widespread acceptance.

Grave Doubts

After Ira Schoen approached me to develop an eight-hour rendition of the course for high-ranking managers in his directorate, I had grave doubts that anything significant could be accomplished.

Even worse, Ira's initial description of what he wanted was, simply stated, wild. I certainly sided with the Automatic Data Processing (ADP) Division analyst who believed that Ira's course length was too short to meet fundamental objectives of introductory training for user managers.

Later, after Ira and I completed in-depth discussions on his training needs, we both tempered our views as to what should and could be done.

Ira came down to earth and agreed that if the course only imbued his colleagues with a basic appreciation of information systems, he would be satisfied. And I finally admitted to myself that a day of fun and games on the machines would at least help the managers feel pleasantly disposed toward computers.

Well, for reasons I didn't understand at the time, it turned out that the courses were very well received. The attendees accepted the instruction with unusually good humor, attacked the hands-on exercises with gusto and peppered me with questions throughout the breaks and even after the class ended. Most important, they all seemed to comprehend computer concepts.

The feedback I received later from the attendees suggested that much of the success of the program was attributed to the "friendly social environment" in the classroom, a setting that was, in fact, established by Ira's preplanning actions for the class. Specifically, he:

- Requested that all 40 ranking members of management be directed to attend the class, and all who were not ill at the time did.

This action, plus the limit of six to a class, seemed to build a sense of camaraderie among the attendees — a "we're all in it together, guys" sort of feeling.

- Arranged that, insofar as possible, peers were assigned to the same training session.

This action tended to eliminate anxieties that often occur when managers and their supervisors attend a course together. The attendees viewed the course as only another business meeting and in no way a threatening situation.

- Made personal visits to many of the senior managers to provide additional assurance that the course would be easy to understand and well worth their support.

The wide differences of opinion that Ira and I initially had on course design only illustrates, in a modest way, the communications gulf that separates DPers from user organizations.

The object lesson to be learned from this story is that both users and DPers are often too prone to ignore the others' perspectives and jump to erroneous conclusions. Certainly I was guilty of such thinking with respect to the design of the one-day course.

A more significant issue is that of ADP departmental support of the users. Regarding Ira Schoen's problem of the deferral of his unit's long-range system study, I have only presented Ira's perceptions in an attempt to capture the depth of his frustrations.

Of course, the DP people in Ira's agency — like DP people everywhere — have their own perceptions on the support that they give to their users and deserve to be listened to before judgments are made.

And on this point, let me provide some fatherly advice that you've probably read a dozen times, but is worth repeating: Users and DPers need to spend a lot more time together listening to the others' frustrations, learning how to team up to address problems and trying to understand the others' feelings and attitudes if they expect to develop the working relationships necessary to produce successful systems.

Letters to Stone should be addressed to him at Box 270, 1377 K St., N.W., Washington, D.C. 20005.

READER COMMENTARY

Critics of Proposed Cobol Standard Should

I would like to point out the advantages of the proposed Cobol standard. I feel that any real end user will see that the benefits of the standard far outweigh any problems with it.

Unfortunately, virtually all of the letters that the American National Standards Institute's X3J4 committee has received are carbon copies of either Travelers Insurance Co. Senior Vice-President Joseph T. Brophy's or the Data Processing Management Association's (DPMA) complaint and came from managers, not users. I suspect that very few of the respondents have the faintest idea of what is in the new standard.

It appears that all of the enmity being generated is because it has been stated that the users would have to rewrite all of their programs. The opponents of the proposed standard indicate that the rewrite would have to be done almost immediately.

Neither of these statements is true. The creation of a new standard does not force anyone to do anything. No implementor is required to implement it; no one is required to use it. It is merely a guideline for the language.

Government and user pressure are what cause vendors to provide a compiler conforming to a new standard. Stated another way, it is the normal healthy pressures of the competitive marketplace that determine the effect or absence of effect of such a standard.

Normally, immediately after a Cobol standard is approved, the federal government issues a Federal Information Processing Standard (Fips), which requires all vendors who are replying to government procurements to supply a compiler that conforms to the new standard. Also, they require the vendors to submit their compilers for validation by the Federal Compiler Testing Service.

The usual time for this compliance is 18 months from the date of the Fips. Since most vendors wish to sell to the government, the vendors provide such a compiler.

However, in no case in the past or in the foreseeable future do vendors immediately throw out their previous compiler. Normally, all vendors will support the old compiler for many years. IBM just recently announced that they were withdrawing support from their 68 compiler (13 years after the 68 standard was approved).

All this means is that they will not fix bugs. The compiler will still run and probably will continue to do so for many years. Therefore, you can

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User Focus On Systems

(Continued from Page 37)

example, trying to replicate a report generator in a query system.

Perhaps some of these features could be provided through a postquery editor, a facility that does not exist today in any system of which we are aware.

A postquery editor would be able to perform reformatting and text-oriented operations suitable for modifying a report file. It would allow the user to change the looks and content of a report file to suit his needs. Column labels could be modified and enhanced, footnotes added, columns switched, data modified and so on.

Incidentally, a data management system that requires output of detail lines in order to obtain totals is another irritant that makes users wonder who designed the system.

Another desirable feature that is often lacking in a data management system is the generation of interim information on how many records qualify for the query's answer-set. This is useful in determining the adequacy of the query that will pinpoint the response, as well as the practicality of generating a report.

But there is also another key benefit. By identifying an answer-set one has implicitly identified a subfile. It should now be relatively simple to direct the system to subset such a file, either in a virtual or real mode.

Such a file subsetting facility would be further enriched if the data management system also had a file merge function so that more flexibility in modifying data would be possible. This feature would allow for dynamic creation of new files by merging several subsets of existing files.

Finally, we mention the importance of the default condition. A typical user usually operates with the same file and similar data updates and queries. The system can take advantage of this by always presenting to the user a default condition for the prompts and specification forms.

These defaults would reflect the most recent use of the system for that user. In this way, input keystrokes as well as key errors are minimized.

Frank is executive vice-president of Informatics, Inc. in Woodland Hills, Calif.

Donald F. Nelson

Examine Advantages Before Rejecting Plan

expect the 74 compilers to be supported for about seven years after the approval of the new standard and they will continue to compile and execute programs for a considerable number of years after that.

Because there seems to be so much concern about conversion, it would pay for the implementors to support the old compilers longer.

In many cases, implementors merely add the new features to the old compiler and provide a method of running either the old or new version on the same compiler. This basically means that there will be no conversion for a very long time.

What does this mean for the Cobol user? It means that he does not have to convert immediately (if he wishes to convert at all). In reality, the conversion from the 74 standard to the 80 standard is a simple process, and most of the differences can be handled by a language conversion processor (LCP).

Such LCPs are already under development. The few items that cannot be translated are very obscure cases and probably do not appear in any existing programs.

However, an LCP can indicate that there may be a potential problem. That means that there is not a single difference that cannot be either converted or flagged. It also seems that if the federal government is the agency responsible for testing and enforcing standards, they should provide an LCP for public use.

Painless Ways to Convert

There are painless ways to convert if it is necessary to do so. Almost all product programs have to undergo major revisions at various points in time. The ideal time to convert them would be just before adding the new modifications (use an LCP, not hand-conversion).

Then, the new modifications could be added using the new structured programming facilities and the program could be tested. This removes the need for separate testing and the program will be easier to maintain and modify in the future.

By applying this technique as well as writing all new applications in Cobol 80, almost all programs would have been converted (just about for free) if the old compiler ever quit running. Obviously, if programs were never modified it would never matter if bugs were not fixed in the old compiler. It will still run the old programs.

I am somewhat curious what all of the letter writers and opponents of the standard mean when they assume it is not compatible. One can only infer that a new standard must be exactly like the previous one unless a new feature can be added without any new reserved words at all or without possibly impacting an implementor extension.

Basically, Cobol should become static and never change. I believe that static is similar to the 68 standard. Is that what the "users" who hurried to send form letters to X3j4 want? Suppose the current proposed standard was not passed and a 100%-compatible standard was substituted. In this case, I suspect the use of Cobol would drop off drastically.

Any improvement to the language can result in an incompatibility in various ways. Both X3J4 and the Codasyl Cobol Committee try to minimize incompatibilities whenever possible. However, if it results in a nonsense language construct, it is better to go to a clean construct.

I believe that the improvements in maintenance will result in the largest cost-savings to users of the 80 standard. Several publications have had recent articles stating the maintenance costs are about 80% of total software costs. By removing archaic constructs such as ALTER and independent segments, the burden on the maintenance programmer is considerably eased.

However, the structured programming and block structure facilities are the features that will result in the greatest savings. In the long run, the new Cobol will result in very large savings for both development and maintenance. It will reduce the number of programmers needed to code and maintain Cobol systems. It will reduce the training costs for programmers. It will reduce the documentation costs. Overall, even if some conversion is necessary, any installation will be better off financially if Cobol 80 is used.

In conclusion, I would like to state that the alarmists are wrong and that a new Cobol standard is needed. It will be beneficial to all Cobol users and to the management of such users. Also, I would suggest that those who wish to write to X3J4 (either pro or con) should first read the standard and then make specific comments. Just stating that the standard is not compatible is a waste of their time and X3J4's.

Nelson is chairman of the Codasyl Cobol Committee.

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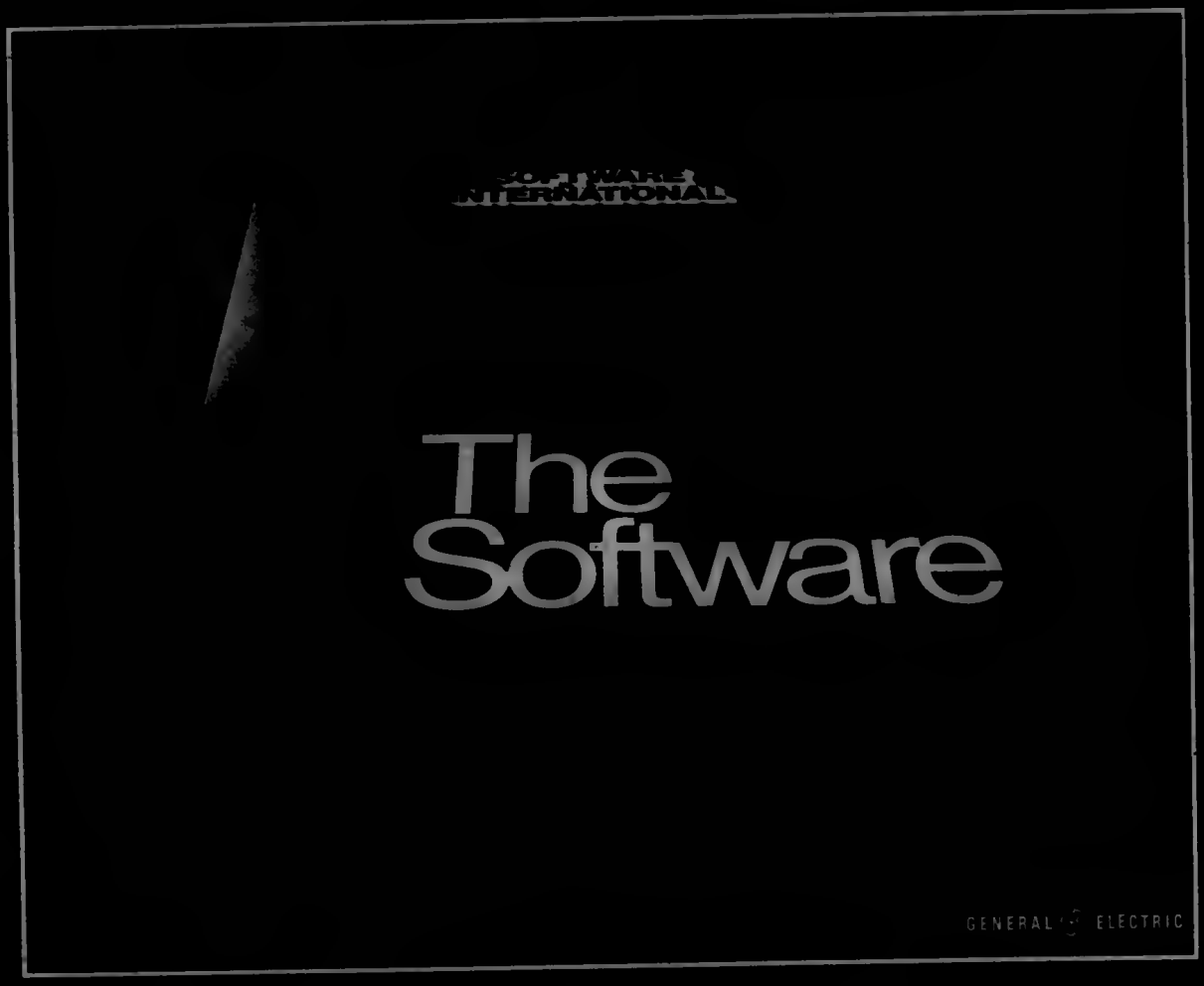

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Speaker Advises: View Programming As Science, Not Art

By Marcia Blumenthal
CW Staff

SAN FRANCISCO — To assure successful "fourth generation" application development, DP professionals must view programming as a science and not as an art.

"A program is an extension of a computer and is a machine component that uses engineering disciplines," explained Martin Goetz, senior vice-president and director of the Software Products Division of Applied Data Research, Inc. Structured programming was the first outgrowth of the view that software is an engineering discipline, he said.

The scientific approach to programming is critical to "fourth-generation" software, Goetz told a group here attending the recent Computerweek conference. Users must take what they have learned from third-generation software and adapt those principles to the emerging fourth-generation software.

The components of successful third-generation software — that written during the 1970s — included the interface to the operating environment; operations systems such as data base managers, data dictionaries and network control features; and programming tools, including compilers and generators.

(Continued on Page 42)

Virtual System Fits IBM DOS/VSE

SAN FRANCISCO — Software Pursuits, Inc. has announced DOS/MVT/VSE, a virtual operating system that reportedly is fully compatible with IBM's DOS/VSE Advanced Functions releases.

MVT/VSE, as it is called, includes 15 dynamically allocated regions for on-line or batch processing, the vendor said. Virtual memory capability has been enhanced through the use of private page pools and better paging algorithms designed to optimize CPU utilization and increase performance, the vendor said.

The operating system reportedly will run on IBM 4300 in ECPS:VSE mode, as well as on other IBM and plug-compatible mainframes. It is said to simulate missing hardware features, allowing the full IBM 4300 series instruction set to be used on all CPUs, including the IBM 360. The vendor added that it provides disk device independence and also will simulate block multiplexer functions on selector channels to allow attachment of any vendor's 3330-typedisks.

The MVT/VSE nucleus reportedly is built during Initial Program Load to conform to previously assembled user options. It includes multiple Logical Transient Areas that are designed to eliminate the transient bottleneck that affects DOS-type operating systems.

Under VM, the system optimizes for execution in a VM environment, the vendor said. A CMS interface using the MVT/VSE spooling system, Sage, is said to allow reports to be automatically routed to a specific CMS user.

MVT/VSE's Procedure Library support stores catalogued JCL in the source statement library to be retrieved and presented to the Job Control processor at high speed, the vendor continued.

DOS/MVT/VSE is available on a month-to-month rental that ranges in price from $600/mo to $900/mo, depending on CPU size. Software Pursuits offers on-site conversion support that includes up to two weeks of installation, interface with other system software products, training classes and coverage during the first few days of live production. The on-time charge for this service is $3,500.

Software Pursuits is headquartered at Suite 800, 444 Market St., San Francisco, Calif. 94111.

Relate/3000 Gets Graphics Option

MOUNTAIN VIEW, Calif. — Relate 4.10, an enhanced version of Relate/3000 — a relational data base management system for Hewlett-Packard Co. 3000 series computers running under MPE — now includes a color graphics option, a transaction processing system, the ability to update views and 17 data manipulation functions, Computer Resources, Inc. announced here.

The optional graphics facility offers color pie charts, bar charts, line graphs, scattergrams and histograms from any data base on the HP 3000, the vendor said.

The transaction processing facility enables users to make data base changes either permanent or temporary. Therefore, if the user has to stop a transaction before its normal completion, the data base is left intact without modification, the vendor explained.

Additional features in Relate 4.10 are said to include the ability to update views or virtual files and data manipulation functions such as automatic calculation of medians and standard deviations.

Relate/3000 Version 4.10 is available for $18,500. The graphics option is available at an introductory price of $4,500, the vendor said from 2570 El Camino Real, Mountain View, Calif. 94040.

DOS Version of 'Com-plete' Out for IBM Users

RESTON, Va. — Software AG has introduced a DOS version of Com-plete, its interactive program development package and teleprocessing monitor for users of IBM and plug-compatible mainframes.

The DOS version of Com-plete reportedly includes all of the on-line transaction processing, program development and productivity enhancement tools of the OS-compatible version. This includes an on-line editor and system execution monitor.

Com-plete is available at an introductory price of $36,000 for IBM 370, 303x and 4300 DOS/VSE users. It will be available April 1.

Software AG is located at 11800 Sunrise Valley Drive, Reston, Va. 22091.

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'Cobol Optimizer' Updated For IBM DOS/VS(E) Users

PHOENIX — Capex Corp. has announced Release 3 of its DOS/VS(E) Cobol Optimizer, which reportedly includes enhancements designed to improve its capability and reliability and the programmers' ability to locate and resolve program problems.

The detector component of the product has been improved to aid in the location of abends, the vendor said. Probable causes, suggested actions and an English language description of the abend code has been added.

The analyzer and detector components have been extended to provide logic checks and summarized debugging information for both multimodule and batch IBM DL/1 programs, the vendor continued.

Mixed Fixed-Block Architecture disk devices reportedly are now supported for both the compiler and Optimizer III work files; and multipartition support (DOS/VSE only) permits simultaneous execution of Optimizer III in more than one partition.

Optimizer III enhancements are available to all current users at no extra cost. Otherwise, the new release is priced from $7,500 to $14,950, the vendor said from 4125 N. 14th St., Phoenix, Ariz. 85014.

Key to Fourth Generation: Programming As Science

(Continued from Page 41)

But the problem with these systems is "they are not fully integrated and do not have the management control they should have, nor do they take into account the people in the organization who have to interact with the computer," Goetz summarized.

While the applications of the 1970s had life spans of 10 to 15 years, those written in the 1980s must have even longer lives, with 20 years not being an unreasonable time span. During the last decade, applications were volatile, conceived by a key developer and had heavy maintenance requirements.

By contrast, Goetz maintained, fourth-generation software emerging during this decade will be even more volatile, must be engineered to exist independently of the original development team and consume no more than 30% of a DP operation's labor resources for maintenance.

Four Capabilities

Moreover, fourth-generation software must exhibit four distinct capabilities, Goetz said.

- Be integrated and compatible. These systems must be capable of working easily with other products. Two products must be able to access the same data base at the same time without copying and must have a common data dictionary.
- Be transparent and portable. Users must be able to access systems without knowledge of the data structure.
- Use very high-level languages. These languages must be significantly higher than Cobol or PL/1, do testing and debugging at the source level and reduce the level of expertise needed to utilize them.
- Have a high degree of human engineering sensitivity.

Two types of fourth-generation "integrated" products are already finding their way to market: Cobol program generation systems and interactive applications developers.

Cobol generators accept input from data dictionaries, paint screens, contain teleprocessing commands, have data base access and test data generation. "These systems can serve as an emotional and technical bridge to introducing new software components into the organization," Goetz stressed, recognizing that DP professionals are slow to change their programming languages and methods.

The other product is interactive application development systems. These systems offer productivity gains of five to 10 over existing systems. They should be used for new applications systems, Goetz urged.

Although these products are starting to emerge, DP departments have been slow to adapt these new techniques, Goetz said. People and management are the major hurdles to using this new software technology.

In many cases, companies do not want to be under the control of a data base administrator who is the key to the integrated approach required by fourth-generation systems.

Video Graphics Out For Raxco 'Rabbit-2'

ATLANTA — Raxco, Inc. has added video graphics features to its Rabbit-2 performance analysis software.

New features include automatic scaling to maximum height and width of Digital Equipment Corp. VT1000 teminals, vertical and horizontal bar graphs, reverse image and bar selection and multiple graph superimposition, the vendor said.

Rabbit-2 costs $2,495 or can be leased for $90/mo. For RSTS/E and VMS systems the package costs $3,995 or can be leased for $200/mo, the vendor said from Suite 200, 6520 Powers Ferry Road, Atlanta, Ga. 30339.

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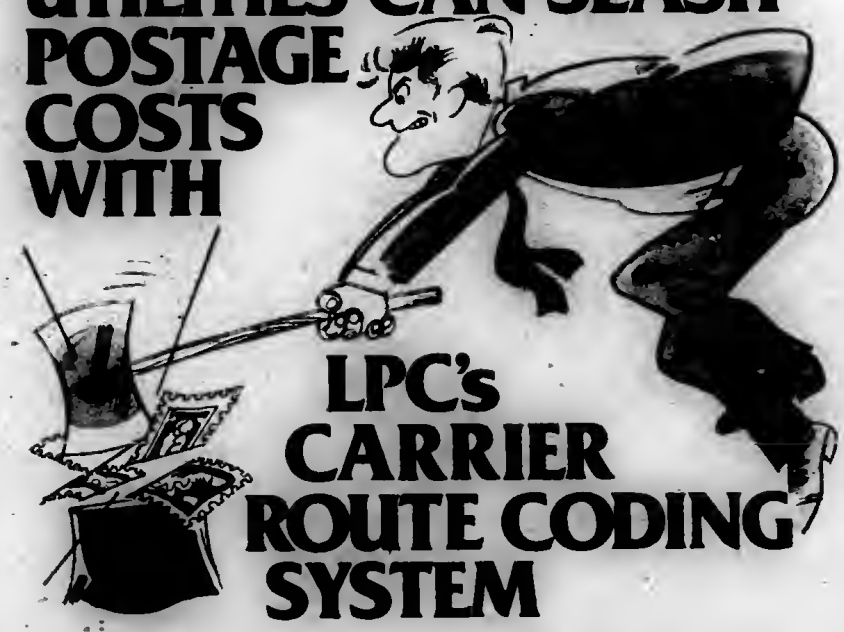

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Informatics Updates 'Answer/2'

CANOGA PARK, Calif. — Informatics, Inc. announced here that Release 9.0 of its Answer/2 report writer includes an option for data base transparency, improved library access and enhanced Vsam file support.

The generalized data base interface reportedly permits transparent access to virtually any data base management system. Release 9.0 also includes improved and extended access for the Answer/2 library, the vendor said.

Library search sequence can be specified in addition to library names and the Vsam access method has been added.

A "branch-if-true" operator, IBM 3800 printer support for page width, IMS checkpoints, user control of abends and improved file coordination processing also have been added with this release, according to the vendor.

Release 9.0 will be provided without charge to all current Answer/2 users who receive Informatics software support through an annual improvement maintenance and service agreement. Otherwise, it can be purchased for $25,000 in OS environments and $15,000 in DOS.

Informatics is located at 21050 Vanowen St., Canoga Park, Calif. 91304.

File Package IBM-Compatible

McLEAN, Va. — Meta Systems, Inc. has announced Interac, an Isam/Vsam file maintenance package for IBM 370-compatible systems.

The package features processing capabilities in both batch and interactive modes. It is self-documenting and programmer/analysts can accommodate end-user changes without reprogramming, the vendor said. The package costs $2,400 from 1500 Planning Research Drive, McLean, Va. 22102.

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'Vollie 3.1' Release Tied to IBM's IPF

PRINCETON, N.J. — Applied Data Research, Inc. has announced a new release of Vollie, its on-line programming package for IBM DOS/VSE systems, which reportedly enables users to run IBM's Interactive Productivity Facility (IPF) in either a teleprocessing or batch partition.

IPF support for Vollie is available to sites running DOS/VSE Release 2 or later releases and allows users to select the processing environment that best suits their requirements, the vendor explained.

With Vollie 3.1, IPF can be run in either a teleprocessing or batch partition, according to the vendor. When needed, a function can be activated in a batch partition under the control of the Vollie terminal. After IPF processing is completed, the batch partition and its resources are released.

Other Features

Among the other features for Release 3.1 of Vollie are support for IBM 3270-type terminals; support for fixed block architecture devices, including updating of source and procedure libraries; an interactive PL/I program language syntax checker; and multiple command support that allows a string of commands to be executed without intermediate screen displays, according to the vendor.

Vollie 3.1 is available at no additional charge to current licensed users of the product. The permanent license price for new users is $17,000.

Applied Data Research is located at Rt. 206 & Orchard Road, CN-8, Princeton, N.J. 08540.

WITH UP PEOPLE

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The rapid growth of computer technology continues unabated, and people in the DP/MIS industry need to grow with it.

In our April 26 Special Report, edited by Marcia Blumenthal, we will take a look at the different options available for increasing people productivity — from technical to organizational. On the technical side, you'll read about the use of nonprocedural languages and how to get a more rigorous design for information systems. And on the organizational side you'll learn how MIS executives are incorporating psychology with technology to increase productivity. There's alot of interest in programs for training, motivation, and aligning the DP department's goals with those of the company.

No matter what your job function is in the DP/MIS field, you'll want to know what's out there to increase both your personal productivity and that of your employees'. You'll get all the answers from the most up-to-date information.

And if your products or services will increase people productivity, here's where you'll find your customers, reading *Computerworld's* Special Report, "Increasing People Productivity". Ad close is April 16. Contact your local sales representative or Frank Collins at (617) 879-0700.

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Job Scheduler Out For OS Systems

ALAMEDA, Calif. — Maxima Systems Group has announced a Job Initiation Management Scheduler (Jims) designed for use on IBM and plug-compatible mainframes running under OS.

Jims reportedly eliminates production reruns due to operator errors, out-of-sequence runs, job-control problems and inadequate-run books. The vendor claimed it facilitates faster throughput by eliminating operator intervention and reducing waits.

Written in assembly language, Jims provides audit trails of production and test runs without reference to console logs, the vendor explained. Through the use of vertical and horizontal dependencies, scheduling is maintained in proper sequence, although provision is made for out-of-sequence additions to the job stream, the vendor said.

A perpetual license for Jims is available at $8,500, the vendor said from 406 Westline Drive, Alameda, Calif. 94501.

Brochure Targets IMS/VS Users

NEW YORK — The "IMS/VS Application and Debugging Reference Card" is available from Computer Systems Development, Inc.

The brochure is said to contain information commonly used by applications programmers in IBM IMS environments to facilitate coding, testing and debugging activities.

It costs $1 from Computer Systems Development, 225 W. 34th St., New York, N.Y. 10122.

Assembly Language Version Of 'Data Security Facility' Bows

PRINCETON, N.J. — An assembly language version of its Data Security Facility (DSF) for IBM and plug-compatible mainframes was introduced here by The Princeton Software Co.

The vendor said the software is functionally equivalent to the original Fortran version of DSF and provides generalized data encryption capabilities with four possible modes of encryption.

DSF can perform 5,000 standard Data Encryption Standard encryption/sec on an IBM 3033, the vendor claimed, noting that the routines are accessible by both high- and low-level applications and can be installed in both existing and new applications requiring data security.

DSF is available on a perpetual license basis for $2,500 or on a monthly basis for $200 for the first CPU with quantity discounts for additional CPUs, the vendor said from P.O. Box 1317, Princeton, N.J. 08540.

'Jobs' Package Targets Users Of IBM 370, 4300

DAYTON, Ohio — Dapsco, Inc. has announced Jobs, a menu-driven JCL management package for users of IBM 370 and 4300 series processors.

The package runs under Release 34 and above of CICS and Release 1.5 and above of IBM's DOS/VSE operating system.

With the package, users can allow end users to tailor and submit batch jobs from any CICS terminal. Users select job models by stepping through a hierarchy of menus. Every selection on a menu can be linked to either a job model or another menu. Individual job models can be password protected, the vendor said.

The package costs $5,400. It can be leased for $135/mo on a one-year lease and $150/mo without a lease, the vendor said from 1544 W. Dorthy Lane, Dayton, Ohio 45409.

Package Focuses On Environment

BROOKLYN HEIGHTS, Ohio — The Effluent Analysis System is a software package designed by Republic Technology Corp. for firms concerned with water outfall and compliance regulations established by the Environmental Protection Agency.

The Effluent Analysis System is written in ANS Cobol and runs on a medium to large-scale IBM 370 or compatible machine. The package produces a compliance report, comparing sample analyses with the permit standards established by the user's National Discharge Elimination System permit. Effluent characteristics can be monitored on a daily basis and both maximum daily and monthly average loadings can be reported by the system, the vendor said.

The software can be purchased for $15,000 from Republic at 707 Brookpark Road, Brooklyn Heights, Ohio 44109.

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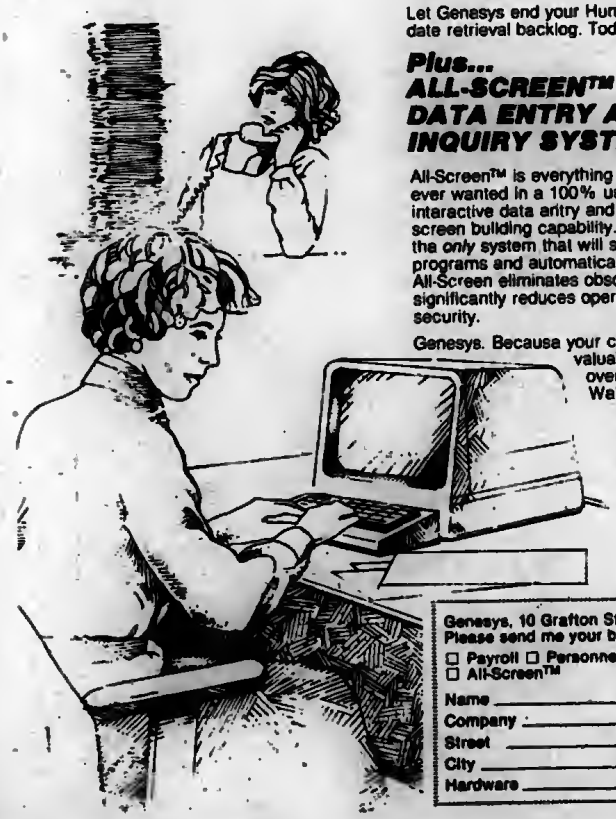

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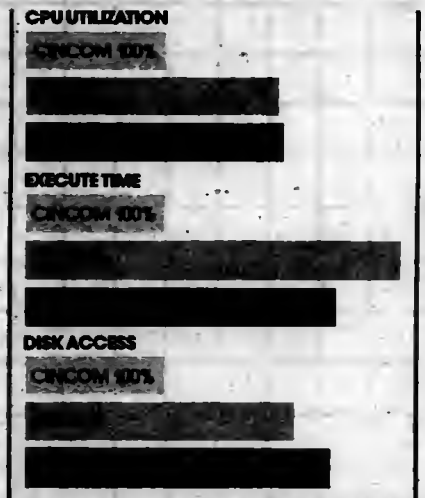

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- IDC reports August, 1980; March 1981

Cincom Systems

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Payroll Aid Out For DEC Systems

GLENDALE, Calif. — Theta Business Systems, Inc. has announced the availability of its payroll package for Digital Equipment Corp.'s RT-11, TSX-Plus, RSX-11M and RSTS/E operating systems. The package is also said to be supported on the Hewlett-Packard Co. HP-1000 processor.

Features include time-card entry, employee-time entry and editing, payroll calculation, check printing, government tax reporting and manual check and adjustment facilities.

The package costs $1,500 on the RT-11 operating system. It costs $2,500 on RSX-11M and HP 1000 systems and $3,600 on RSTS/E, the vendor said from 1110 Sonora Ave., Glendale, Calif. 91201.

For VAX, PDP-11s, Decsystem-20s

Cobol Generator for DEC Enhanced

ELMWOOD PARK, N.J. — Business Controls Corp. has announced Version 2.3 of its Systems Builders-5 (SB-5) Automated Cobol Program Generation System for use with Digital Equipment Corp.'s PDP-11, VAX and Decsystem-20 computers.

The SB-5 is said to provide automated design, production documentation and maintenance of Cobol language application software. It integrates four new programs, the vendor said, including a parameter maintenance program, a design preview generator program, a program generator program and a document generator program.

Three subsidiary programs that also have been added to Version 2.3 include a cross-reference report, a flowchart generator and a project statistic report program. Content of description files now has been updated to define data file names and to note the directories and devices in which the data file is to be found.

The SB-5/V2.3 does not obsolete prior versions of SB-5, and the inclusion of additional parameters in future versions of SB-5 will not obsolete V2.3, the vendor said.

Cost of a first unit for use on DEC's PDP-11 is $14,000, for VAX is $28,000 and for Decsystem 20 is $45,000. Multi-installation discounts are available along with a one-, two- or three-year lease/purchase option. Business Controls Corp. is located at 507 Blvd., Elmwood Park, N.J. 07407.

DEC VAX, PDP, LSI Users Get Pascal Development System

NEW YORK, N.Y. — A Pascal Development System based upon its C language compiler was introduced here by Whitesmiths, Ltd. for users of Digitial Equipment Corp. VAX-11, PDP-11, LSI-11 lines as well as for various microcomputer systems.

Both native and cross compilers are available running under DEC's VMS, RSX-11M, RT-11 and IAS operating systems and under Bell Laboratories' Unix V6, Unix V7 and Unix 32V operating environments, the vendor said. All versions can generate read-only memory code while cross-compiler packages also include native mode code generator.

Users also get full use of the C language since a compiler for the C programming language underlies much of the Pascal implementation, the vendor said. Pascal, C and assembly language modules may be freely intermixed with standard calling sequences, the vendor added.

A binary license for the VAX-11, PDP-11 and LSI model is available. The native Pascal Development System is $950/CPU. The cross-compiler package costs $1,550. Both are covered by a 90-day warranty with extended maintenance and source license also available.

Whitesmiths, Ltd. can be reached through P.O. Box 1132, Ansonia Station, New York, N.Y. 10023.

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'Magic/L' Gains Update

WAYLAND, Mass. — Loki Engineering, Inc. has announced expansion of its computer language, Magic/L, for use on Digital Equipment Corp.'s PDP-11 systems running under the RT-11 and RSX-11 operating systems.

Magic/L blends the programming power of a Forth-like interactive environment with a Pascal-like syntax, a Loki spokesman claimed. The language is designed for hardware development, control applications and the creation of user-friendly interactive systems, according to the vendor.

Magic/L features include user-definable data types (record structures), type checking in expressions and interactive programming aides, according to the vendor.

The built-in assembler allows time-critical routines, such as interrupt handler, to be written at machine level, the vendor said.

Initial license fees for Magic/L on PDP-11 under RT-11 or RSX-11 is $2,450, according to the vendor.

Loki Engineering, Inc. is located at 580 Main St., Reading, Mass. 01867.

Contel Offers 'Mpmath' Library, Enhanced 'RTfile' Relational DBMS

BETHESDA, Md. — Contel Information Systems has announced Mpmath, a software library of Fortran-callable macro subroutines, and Version 3.0 of its RTfile relational data base management system (DBMS), for users of Digital Equipment Corp. PDP-11 minicomputers and LSI-11 microcomputers.

Mpmath runs on either the RT-11, RSX-11M or TSX-Plus operating systems. It handles mixed-mode arguments in its subroutines, all of which are reentrant and may be included in a shared resident library, according to the vendor.

Mpmath can perform multiple-precision compare, addition, subtraction, multiplication and division operations, as well as binary to/from Ascii conversions.

The Mpmath software is being offered for $250, including media, documentation and shipping.

Version 3.0 of RTfile runs on the RT-11 operating system and contains enhancements including multifile processing, enabling users to define relations involving up to five separate data bases. It also comes with a new utility, RTmenu, a menu generator that allows users to interactively create menus for their own applications and revise all RTfile menus to accommodate site-specific requirements.

The update is available for $2,500 from Contel at 4330 East-West Highway, Bethesda, Md. 20814.

Vehicle Package Fits HP, DEC

PLANO, Texas — A vehicle scheduling package for use on Hewlett-Packard Co. HP 3000 and Digital Equipment Corp. PDP-11 processors is available from Neuvo Tech, Inc.

Called the Paragon Vehicle Scheduling Package (VSP), it is written in Ansi-66 Fortran and is feasible for small fleet owners or at the local depot level. The package is said to have data validation facilities.

Daily scheduling, weekly and daily route planning, updating of delivery areas, fleet replacement and planning of new depots are among the needs Paragon VSP can meet.

With a 50K-byte memory, Paragon VSP will allow for up to 1,000 different customer locations, up to 2,000 different customers and up to 60 routes per day with up to 80 calls per route, the vendor said.

The package is available now and will cost between $12,000 and $60,000, the vendor said. More information on Paragon VSP is available from Neuvo Tech, 2005 Tree House Lane, Plano, Texas 75023.

Relational DBMS Assists LSI-11/23, TRS/80 Users

ANAHEIM, Calif. — Data Ace, which is described as a relational data base manager for users of Digital Equipment Corp.'s LSI-11/23 microcomputers and Radio Shack's TRS/80 Model II microcomputers, was announced here by Aregon Group, Inc.

The package reportedly consists of a relational data base management system (DBMS) and operating system, a data definition language, an interactive query language, a block-structured programming language and a full-screen text editor.

Data Ace's Data Interrogation Language and Data Definition Language are said to operate in an interactive and conversational mode. The product's Data Manipulation Language (DML) is described as an interactive-structured programming language with some similarities to Basic, Pascal and C. DML may be executed interactively while programs are being prepared, the vendor said, and once tested, these programs may later be compiled for execution.

The data base can be changed without affecting the application programs or procedures, according to the vendor.

The DEC LSI-11/23 version of Data Ace, which includes its own operating system, carries a list price of $6,750 and $2,000 for each subsequent use, according to the vendor. The TRS/80 Model II version of the product is priced at $1,350 and at $400 for additional systems. The user guide lists at $75/volume and $100 for a two-volume set. Multiple site and purchase discounts are available, the vendor said from 1904 Wright Circle, Anaheim, Calif. 92806.

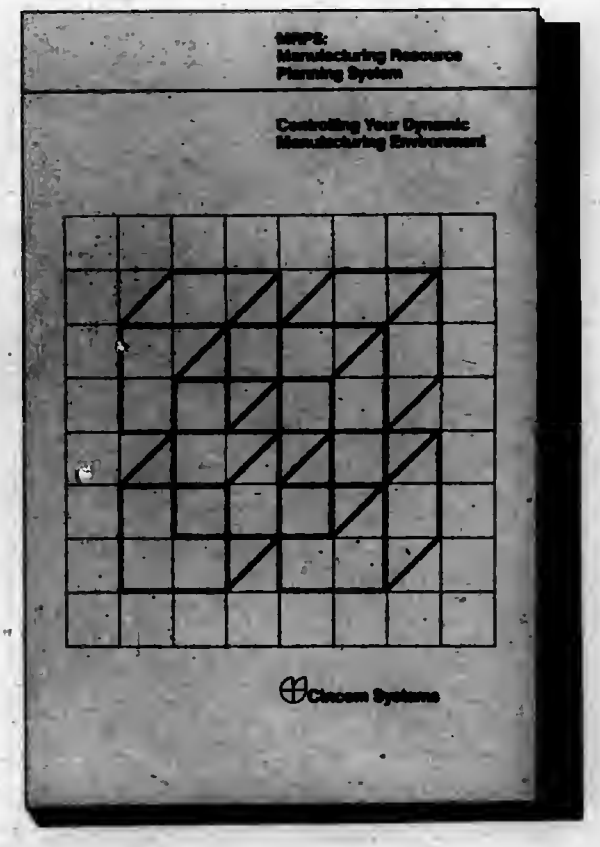
'Tolas' Updated For PDP, VAX

PITTSBURGH, Pa. — Transcomm Data Systems, Inc. has announced new security features for its Tolas financial software package for use on the full range of Digital Equipment Corp. PDP-11 and VAX-11 computers that reportedly will allow users to program their own security levels.

Because the Tolas security features do not require hard coding, the package can be programmed within a relatively short amount of time without changes to the software, the vendor said.

Package features are designed to control computer system access to authorized people, the vendor said, by identifying what functions and what data a person can access.

The package is priced from $7,000 to $13,000 with all features included from Transcomm Data Systems, 1380 Old Freeport Road, Pittsburgh, Pa. 15238.



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CW 4

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900 Data Banks, Packages

T/S Business Network Formed

BASIN, Wyo. — A time-sharing satellite telecommunications network has been formed for business and industry on a worldwide basis. The Business Computer Network (Biznet) provides business and industry access to some 900 informational data banks and microcomputer software packages.

Biznet can communicate with most standard microcomputers at 300- or 1200 bit/sec and is usually accessed from local or regional telephone numbers from almost anywhere in the world, according to the vendor.

Included among the informational banks available on Biznet are Dow Jones averages; stock and commodity prices; airline, hotel, motel and rent-a-car reservation systems; UPI news; weather reports; and others, the vendor said.

Initial computer program software packages available to Biznet users include a complete accounting package, word processing/typesetting, mailing list/label and directory system, subscriptions and association membership systems, order entry/inventory control, sales reporting systems and others.

'Off-Line' Data

To use these packages, customers can purchase software to compile data "off-line." This data is then transmitted to the network mainframe computer for final processing. Upon completion, users simply dial up the network for the finished material.

Average customer fees for this type of service are expected to range from $100/mo to $500/mo. The new telecommunications system will be activated on April 1. The one-time sign-on fee is $195, which includes the subscriber's identification and security system, manuals, directory of services and initial customer support.

More information can be obtained from Biznet, Inc., 211 S. 4th St., P.O. Box 890, Basin, Wyo. 82410.

'Snap' Via T/S Out in U.S., Canada

TORONTO — I.P. Sharp Associates has made its project management package, Sharp Network Analysis for Projects (Snap), available in the U.S. and Canada via its time-sharing network.

The package was designed to make use of Sharp APL's modular structure and speed of development, which the vendor said is the ideal programming language for project management tasks that initially require detailed customization and, during operation, require constant and extensive updating of resource variables.

The commands in the Snap package are said to reflect the terminology and structure of most project management applications. Information reportedly can be obtained on the project's progress at any level of detail, depending on the user's needs.

Snap seminars will be held in Vancouver March 22, in Calgary, March 25, in Toronto, April 5 and in Ottawa, April 8. The seminars are free, but attendees must be preregistered. Further information on the seminars and the Snap package can be obtained by contacting I.P. Sharp Associates, 145 King St. W., Toronto, Canada.

Dialcom Net Gets 'ABI'

SILVER SPRING, Md. — Data Courier, Inc. has announced that the ABI/Inform business and management information data base will be available on the Dialcom, Inc. time-sharing network.

ABI includes abstracts, dating from 1971, from more than 540 publications worldwide in English and other languages, according to the vendor. It can be accessed by searching the file by topic or through an automated method in which managers receive weekly updates of the most recent articles.

ABI costs $48/hour, the vendor said.

More information can be obtained from Dialcom, Suite 410, 1109 Spring St., Silver Spring, Md. 20910.

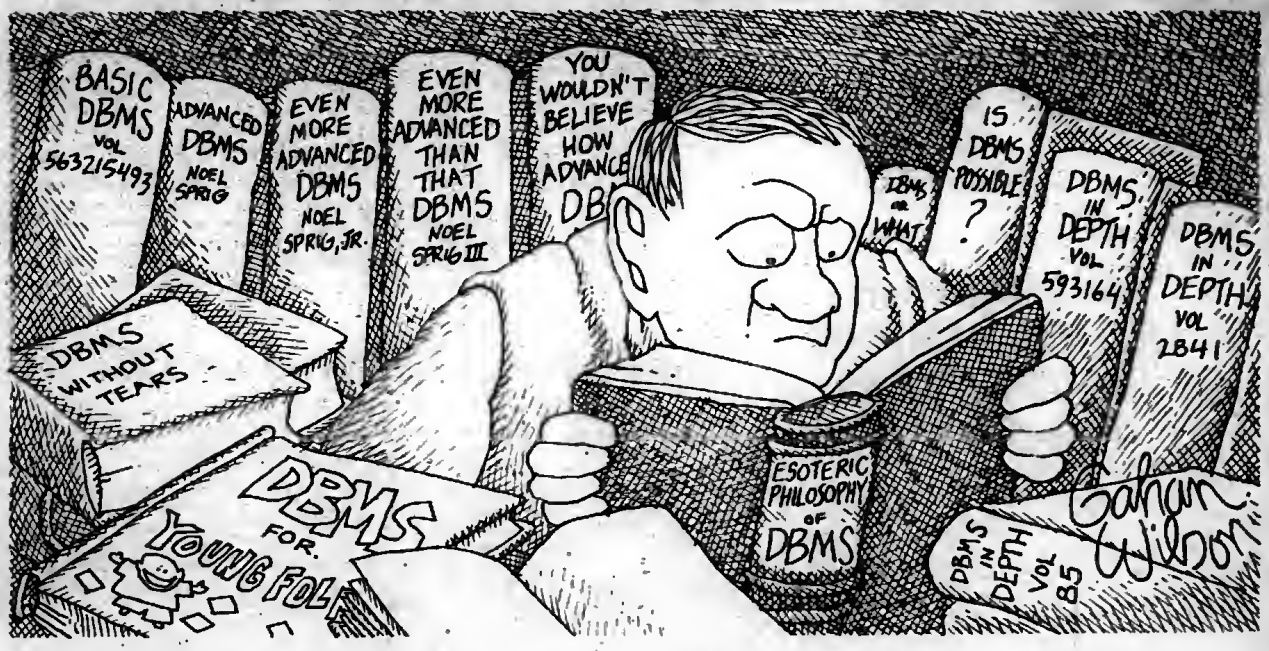
Data Base Aids Ship Industry

STAMFORD, Conn. — Maritime Data Network, Ltd. has made available a data base that provides information on worldwide movements of tankers and gas carriers on the General Electric Mark III time-sharing network.

Designed to assist the marine shipping industry, the data base focuses on the activity of tankers, including oil, liquefied gas and chemical carriers.

An average user can expect to pay $7,500/year including the subscription price, according to a vendor spokesman. More information can be obtained from Maritime Data Network, Ltd., 300 Broad St., Stamford, Conn. 06901.

GOT A LOT TO LEARN ABOUT DBMS? WE'VE GOT A LOT TO SAY.



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Syracuse, NY - April 8
Newark, NJ - May 12
Baltimore, MD - April 20
Washington, D.C. - April 21
Hartford, CT - June 9
Philadelphia, PA - April 15
Boston, MA - May 19
Providence, RI - June 16

Southeast. To register, call Charlene Gaydos at 201/225-3000.
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Chattanooga, TN - April 7
Knoxville, TN - June 16
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Ft. Lauderdale, FL - May 19
Jacksonville, FL - June 23
Orlando, FL - March 31
Tampa, FL - March 24
Greensboro, NC - March 17
Huntsville, AL - April 28
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Norfolk, VA - April 21
Raleigh, NC - June 9
Richmond, VA - May 5

Southwest. To register, call Fay Carter at 214/241-9502.
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Midwest. To register, call Kathy Little at 312/981-7200.
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'Aim/Safe' Handles Recovery, Disaster Contingency Planning

WOODBRIDGE, Va. — Advanced Information Management, Inc. is now offering for license Aim/Safe, a management tool for computer center disaster recovery and contingency planning.

Aim/Safe allows computer centers to identify key processing activities and key decision points in contingency planning, according to the company, which said tasks and subtasks are clearly laid out in relation to various scenarios of disaster and options for recovery.

From fire, sabotage and intrusion to improper equipment installation and maintenance, Aim/Safe was designed to address "any kind of situation or circumstance that will deny the ability or denigrate the ability to process," according to the firm's president, Robert Campbell.

The product includes instruction and background information, data collection sheets, questionnaires, work sheets, analytical tools and decision-making aids, the company said. The object is "to show management exactly what must be done and how you are going to do it so that there are no surprises," Campbell said.

Aim/Safe is offered under perpetual license on a sliding scale depending on the number of centers involved. Fees for one site, including initial consulting assistance, are $9,950. Advanced Information Management will provide, for an additional charge, consulting services up to and including complete implementation of Aim/Safe. The company is located at 1988 Opitz Blvd., Woodbridge, Va. 22191.

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IMSL Fortran Library Available To CDC Users

HOUSTON — International Mathematical and Statistical Libraries, Inc. (IMSL) has announced the availability of its library of mathematical and statistical Fortran subroutines on a subscription basis to users of the Control Data Corp. Cyber 200 series, Models 203 and 205. The library is compatible with these CDC modules with the Cyber 200 Fortran compiler.

The library consists of more than 500 Fortran subroutines that assist in the development of scientific and engineering applications. The subroutines serve as building blocks that are used to customize programs.

They are arranged in 17 chapters, covering such topics as basic statistics, analysis of variance, regression analysis, linear programming and in other areas of mathematics such as differential equations and curve fitting.

The annual subscription rate for the CDC Cyber 200 series is $3,000 for the first year and $2,500 for renewals. For degree-granting universites, the subscription rate is discounted to $1,700 for the first year and $1,500 for renewals. IMSL can be reached at the 6th Floor, NBC Building, 7500 Bellaire Blvd., Houston, Texas 77036.

For Nova, Eclipse Systems

'Mail-Master' Offered on DG

DUNSMUIR, Calif. — Applied Business Systems Co. announced two versions of its mailing list management package, called Mail-Master, for use on Data General Corp.'s Nova and Eclipse systems running under DOS, Rdos and AOS.

According to the vendor, the package was designed for marketing and service organizations that need to build, maintain and retrieve records from large multiple data bases.

Mail-Master features include a list master file containing more than 30 fields of information about subject records and a primary list identifier so multiple types of lists can be maintained within one master file, the vendor said.

The second version of the Mail-Master package comes integrated with Script-Master, a word processing package to retrieve records from a list master file and insert information into standared letters for mass mailings, the vendor said.

The package is available now and the price for a single stand-alone Mail-Master is $1,500, with multiple CPU license — $2,500. An integrated stand-alone Script-Master is $3,000, with multiple CPU license — $4,000.

Applied Business Systems is located at 4350 Upper Soda Road, Dunsmuir, Calif. 96025.

'Mail-All' Gets Update

VAN NUYS, Calif. — Occidental Computer Systems, Inc. has announced Version 3 of its Mail-All mailing list management package.

Called Mail-All/III, the release combines list maintenance, label and letter production, subscription processing with reader service, Zip Code qualification and carrier routing, the vendor said.

Source code and documentation for the package costs $2,960, the vendor said from 6666 Valjean Ave., Van Nuys, Calif. 91406.

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'Screen,' 'Sort' Packages Unveiled for HP 1000

ABERDEEN, N.J. — Corporate Computer Systems has announced Screen and Sort, two software packages for Hewlett-Packard Co.'s HP 1000 system.

Screen is a forms management package designed to increase programmer productivity and system flexibility. It allows the programmer to design, debug and maintain form data interactively through any of HP's 2600 family of terminals.

The position of data on the screen is completely uncoupled from the program that manipulates the data, so changes to forms need not force changes in the programs that use them, the vendor said.

Sort is a general-purpose sorting tool for use with the File Manager in the Real Time Executive operating system.

It operates either interactively or through the use of command files. In the interactive mode, the user is prompted for sort commands and they are executed as received, the vendor said.

Command Files

Command files reportedly allow the user to batch commands into a file and then process all of the commands with the Sort. It will process any size file and sort up to 100 keys in either ascending or descending sequence.

A Screen/1000 license costs $1,800 per CPU and Sort/1000 costs $995 per CPU. CCS offers a software update service and a phone-in consulting service for both products.

More information can be obtained from CCS, 675 Line Road, Aberdeen, N.J. 07747.

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Dearborn, MI *March 25*	Oak Brook, IL *April 8*	St. Louis, MO *April 7*
Des Moines, IA *April 6*	Oklahoma City, OK *March 18*	

International Seminars

Calgary, Alberta, Canada *May 12*	Manila, Philippines *April 1*
Dublin, Ireland *April 15*	Montreal, Quebec, Canada *April 6*
Geneva, Switzerland *March 30*	Paris, France *March 24*
Hong Kong *March 30*	Singapore *March 25*
Kuala Lumpur, Malaysia *March 23*	Toronto, Ontario, Canada *March 25*
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CW 861 (3/15/82)

Enhanced 'Mensys' Boasts Batch Processor Support

HELENA, Mont. — Professional Systems, Inc. has announced Release 5.0 of its Mensys Executive System utility, which reportedly includes support for a batch stream processor and a job-logging function. It was designed to allow any program on the IBM Series/1 to be loaded with a menu.

The package is supported by the Event Driven Executive IBM operating system for the Series/1. Any function can be performed from a menu-driven environment, including submission of jobs to a background batch stream processing supported by the system, the vendor said. A set of utilities supports system generation and operation.

Supported terminals are said to include the IBM 4978, 4979, 3101 and a variety of teletypewriter-compatible asynchronous devices. These may either be local or remote, using direct or dial-up attachment.

Mensys is available for $1,500 from Professional Systems, Inc., P.O. Box 1114, 300 Fuller, Helena, Mont. 59624.

System/34 Users Get Job Cost Program

BELLEVUE, Wash. — Monitor/34 is a job cost accounting program for IBM System/34 users developed by Genesis Software Corp.

The software package reportedly captures CPU time and print time by workstation, user ID, job name, application and by user/workstation combination on a daily basis. It also maintains year-to-date and month-to-date totals by workstation, user ID, job name and application code, the vendor said. This information enables managers to monitor the cost per minute of each job, terminal or application and improve work flow and scheduling.

Monitor/34 is currently available at a cost of $500, including installation, complete documentation and a 30-day money-back guarantee from the vendor at 1408 140th Place N.E., Bellevue, Wash. 98007.

System/34 Package Assists CPAs

FREDERICK, Md. — The Fixed Asset Accounting and Depreciation Package designed for IBM System/34 users is being offered by the Certified Public Accounting firm of Linton, Shafer & Co.

The package is said to automate record keeping and depreciation reporting of both old and new laws.

It is intended for use by private companies and CPA firms alike, because the system incorporates accelerated methods of depreciation provided under the Economic Recovery Act of 1981.

It also features a state depreciation calculation for each asset in addition to book and tax methods.

The software package is available at $1,500, including RPG-II source code. Continued maintenance costs $150/year, the vendor said from 6 W. Second St., Frederick, Md. 21701.

Apparel Software Fits System/34

READING, Penn. — The Software Brokers, Inc. have introduced two systems designed for the apparel and knitting industries that will run on the IBM System/34.

The IBM Apparel Business System allows for more complex requirements and larger field sizes than did an earlier version, the vendor said. The system also plans for circular knit fabric width requirements and a month-by-month planning breakdown. This system's price is $5,000.

The Fabric Control System was designed for control of all cloth by providing up-to-date information for the production and inventory control department on a timely basis. It also provides information for management of the knitting plant and cost information for accounting purposes, according to the vendor. The cost of the system is $12,000.

The Software Brokers is based at 3701 Perkiomen Ave., Reading, Penn. 19606.

Package Aids Radio Stations On System/23

SALT LAKE CITY, Utah — Libra Programming, Inc. will be distributing a software package for use by radio broadcasting companies using IBM's System/23.

Developed by Decision Data Systems of Jacksonville, Texas, the Libra Broadcast System reportedly can perform manual tasks such as logging time slots, station bookkeeping and customer invoicing with one-time handling when entering.

Invoicing will include all transactions with the station, showing when and where time slots were aired and how much they cost, the vendor said. If scheduled airings are interrupted by news breaks or power failures, adjustments are made to meet customers' needs during another time sequence.

The software has an order entry system and includes all the basic elements of management control, traffic scheduling, accounts receivable, credit management and sales management.

The fee for a one-time lease is $7,900 from Libra Programming, 1945 E. 7000 S., Salt Lake City, Utah 84121.

Calendar Package Out For System/34 Users

WINTER PARK, Fla. — Westmoreland Systems, Inc. has announced the Calendar Scheduling System for the IBM System/34.

The Calendar Scheduling System maintains and prints a file of appointments, deadlines and messages by date. It is designed for personal and managerial use in organizing work loads, goals and progress. The records can be displayed on a CRT or printed out on hard copy. User security can be used for confidential information.

The Calendar Scheduling System is priced at $200, Westmoreland said from Suite J, 228 Park Ave. N., Winter Park, Fla. 32789.

Radical Changes Seen

Exec Sees Telematics Exploitation in '80s

By Brad Schultz
CW New York Bureau

SAN FRANCISCO — Telematics has passed from an age of exploration to an age of exploitation, Bell Laboratories' Dean Gillette told a session of Computerweek here recently.

Telematics is the blend of telecommunications and computing technologies that has begun to change radically the way people live and work, the Bell Labs executive director of corporate studies explained. By the end of the 16th century, the world was largely "discovered" — completing an age of exploration in which Europeans crossed oceans to reach other continents, including the New World.

Just as that period marked the beginning of Western civilization's exploitation of other continents, the 1980s represent a period when most potential capabilities of telematics systems have been anticipated, if not implemented, Gillette maintained at the C.W. Communications/Inc.-sponsored seminar.

The theoretical tools for such exploitation are already available or emerging, he said, noting that a "unified theory of information and its manipulation" was devised by John von Neumann and Claude Shannon — working separately — more than 30 years ago.

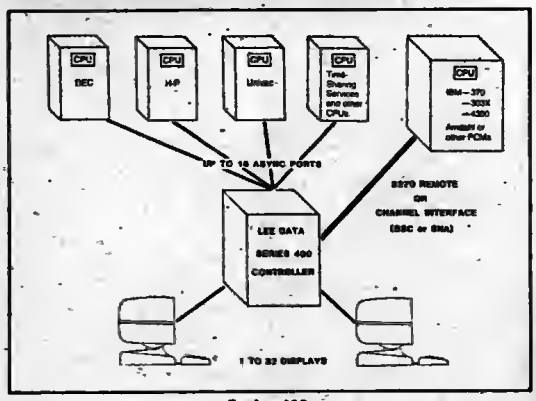
Von Neumann demonstrated the value of binary logic as the basis for digital computation, while Shannon derived fundamental principles of how information can be stored and transmitted, Gillette stated.

During the past quarter century, computer scientists have turned out "the beginnings of a theory of computing," Gillette added. However, a theory of applications programming that would illuminate optimum approaches to developing applications software has not yet arrived, he declared.

Enough theory, as well as

(Continued on Page 56)

Lee Data Enhances Series 400 With IBM 3270 Interface



Series 400

MINNEAPOLIS — Lee Data Corp. has enhanced its Series 400 3270/Async Communications System to offer access to applications and data from an IBM or equivalent CPU through a 3270 interface.

In addition, the system also provides access to Digital Equipment Corp. CPUs and time-sharing services through multiple direct-connect, autodial or dedicated asynchronous ports. The expanded capability is accomplished with remote or local controllers and a hybrid CRT terminal that emulates the IBM 3278 and DEC VT100 terminals.

A single Lee Data controller provides asynchronous communications via one to 16 RS-232C-compatible ports and 3270 communications through a choice of two interfaces: remote connect using Binary Synchronous Communications (BSC) or Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) protocols or local connect via an SNA or non-SNA link.

Switching between the 3270

(Continued on Page 56)

Northern Telecom PBX Handles Voice and Data

RICHARDSON, Texas — Northern Telecom, Inc. has unveiled a private branch exchange (PBX) offering voice and data communications features for installations with 60 to 400 lines.

The SL-1M is an addition to the SL-1 line and provides all current SL-1 capabilities, including integrated voice and data switching. It supports the vendor's Electronic Switched Network.

The SL-1M can be ordered with an optional magnetic tape unit for collecting call detail records. The unit fits next to the central processor within the controller cabinet.

The PBX allows users to effect most service changes without technical assistance. The attendant administration feature permits the console attendant to change directory numbers and telephone set features from a new console, which has an alphanumeric display to guide the user through the necessary steps.

A second feature allows telephone users to move to a new location and take their telephone sets and all associated features and directory numbers with them. The user enters a code on the telephone, unplugs and moves it to the new location, plugs it back in and reenters the code. The telephone then functions as it did at the old location.

The SL-1M costs between $25,000 and $300,000, depending on configuration, Northern Telecom said from 1001 E. Arapaho Road, Richardson, Texas 75081.

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- LA 36 — DECwriter II $595. plus options
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'Netex' Aids Host-to-Host Communications

MINNEAPOLIS — A line of software packages that facilitate host-to-host communications between mainframes interconnected by Network Systems Corp.'s Hyperchannel is available from that vendor.

Netex provides a universal access method between computer systems of different manufacture and allows data to be transferred at or near channel speeds between network nodes.

The Netex/Hyperchannel system allows multiple application programs in separate hosts to communicate with one another without regard to the actual network configuration. It also facilitates such applications as file and job transfer and transaction processing in either a single- or multi-vendor environment.

Netex support is currently offered for the following operating systems: IBM MVS and VM, Digital Equipment Corp. RSX-11 and VMS and Sperry Univac 1100 operating systems.

Modules are available for $320/mo to $560/mo depending on the host operating system, NSC said from 7600 Boone Ave. N., Brooklyn Park, Minn. 55428.

A NEW STANDARD
IN 4800 BPS MODEMS

Exec Sees Exploitation Of Telematics in This Decade

(Continued from Page 55)

technology (actual hardware and software) exists for people, organizations and society to improve radically the responsiveness of businesses to consumers and of government to citizens, the Bell Labs researcher indicated. For example, people will be able to order car makers to have cars tailored to their specifications by robots.

Telematics is more than the sum of computing and telecommunications, Gillette stated, just as the first train was more than simply a wagon with a steam engine. Trains revolutionized mass transportation; telematics will revolutionize the way people use information.

Joining Gillette at the session, Huntington Beach, Calif.-based consultant Einar Stefferud said telematics will give ordinary people more political power, but telematics cannot determine the ethics of how that power will be exercised.

The proliferation of microcomputers will allow many kinds of people to process information, rather than simply receive it, Stefferud observed; but this may be "scattered processing" — not distributed processing — if users lack products with which different micros can share resources and coordinate functions.

Stefferud predicted that "someone will make a lot of money" by becoming a major retailer of information.

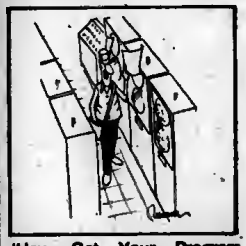
Some companies will wholesale information — collecting it for marketing to retailers. The latter will specialize in helping consumers locate useful information and will offer information as a packaged product consumers can easily apply to special problems, he said.

Lee Updates Series 400

(Continued from Page 55)

and asynchronous interfaces can be done on an individual display basis. A command entered from the keyboard of any hybrid CRT terminal dynamically changes the unit from the 3278's operating personality to the VT100's (including VT52).

A Series 400 Remote System using the BSC protocol for 3270 mode, eight asynchronous ports and 16 All-In-One CRT terminals costs $75,350 for purchase or $2,187 monthly on a three-year lease, Lee said from 10206 Crosstown Circle, Minneapolis, Minn. 55344.



'Hey, Get Your Program Here.'

Hand-Held Unit Communicates With Processors Supporting Ascii

CULVER CITY, Calif. — IXO, Inc. has announced a hand-held terminal that can communicate with any host processor supporting an Ascii character set.

The unit comes with a built-in telephone that can be attached to any modular phone jack.

A modem is not necessary and the firm also offers an acoustic coupler for nonmodular telephones.

The unit has a liquid crystal display screen that can display up to 16 5 by 7 dot matrix characters. The terminal features a 2- to 30-char. scroll rate, kinetic punctuation and a repeat key that repeats the last 80 characters, the vendor said.

The unit comes with an auto dual-tone multifrequency telephone dialer and can accommodate serial communications at 300 bit/sec using Ascii characters in a full-duplex mode.

The terminal is equipped with a 1K byte by 4-bit memory with battery backup. The user can store phone numbers and log-on procedures for several host processors and data bases, the vendor said.

The vendor said the terminal is initially aimed at users of Texas Instruments, Inc. Silent 700 terminals or similar portable terminals. The firm said it plans to market the terminal to companies with large host processers. It will sell the unit to individuals through retail outlets, the vendor said.

The terminal costs $300 in quantities of 1,000 or more. The single-quantity price is $500. The acoustic coupler and RS-232C interface cost $65 each and the video interface and thermal printer cost $150 each. There is a $6/unit initialization fee.

The fee covers registering the terminal with IXO, Inc., establishing a user password and downloading log-on instructions for popular data bases, the vendor said.

The vendor is located at 6041 Bristol Parkway, Culver City, Calif. 90230.

IXO Hand-Held Terminal

Stat Mux Announced

SUNNYVALE, Calif. — Prentice Corp. has introduced a four-channel statistical multiplexer for point-to-point network applications.

The Model SNP 1104 is a microprocessor-controlled device with individual channel and aggregate data rates to 96 bit/sec.

Features include flow control, local echoplex, downline loading and full diagnostics. The integral test pattern generator and clock enable complete unit and systems test with or without a modem, the vendor said.

The multplexer costs $1,195 from 266 Caspian Drive, Sunnyvale, Calif. 94086.

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'ACF/NCP2.1' Release Out For IBM, Compatible CPUs

ST. PAUL, Minn. — The Advanced Communications Function/Network Control Program 2.1 (ACF/NCP2.1) Release 1.0 from NCR Comten, Inc. provides enhanced local and remote control functions for IBM and IBM-compatible host processors.

The communications software provides the support required for the IBM Series 386X or compatible diagnostic modems using Link Problem Determination Aid. It also provides the same functions and features as the IBM ACF/NCP/VS Release 2.1.

In addition, numerous enhancements, functions and features have been added to this release while maintaining compatibility with previous releases, the vendor said. A 3600 System Control Software licensed program product, ACF/NCP2.1 is designed and implemented under NCR's Communications Network Architecture.

The package licenses for $144/mo or $1,584 a year, NCR Comten said from 2700 Snelling Ave. N., St. Paul, Minn. 55113.

'RJE' Upgrade Announced

IRVINE, Calif. — Unique Automation Products, Inc. has upgraded Remote Job Entry (RJE), its binary synchronous communications link to IBM and other host computers, to function with TSX-Plus from S & H Computer Systems, Inc. as well as the Digital Equipment Corp. RSX-11M and RT-11 operating systems.

Improvements include automatic receive mode, spooling print files, indirect command files, concatenate send files, high performance and autoanswer, Unique Automation said.

With TSX-Plus and RSX, users can group RJE commands for execution in background mode while using the terminal for other functions, according to the vendor.

The upgrade to TSX-Plus and RSX-11M costs $400 and RJE costs $2,250, Unique said from Suite L, 17922 Sky Park Circle, Irvine, Calif. 92714.

Pars Users Gain Univac Terminal

BLUE BELL, Pa. — A CRT terminal designed for airlines using the IBM-based Pars/ALC passenger reservation system is available from Sperry Univac.

Model UTS 4000 is equipped with a customized airline application keyboard; special microcode and a multiplexer that functions as a Pars-compatible interactive terminal and controls up to 31 attached workstations, the vendor said.

Other features include response-time measurement and reporting, communication error-rate logging and reporting, supervisory monitor, downline parameterization and configuration control and buffered loopback operation for both diagnostic and high-volume load-testing operations.

Model UTS 4000, including multiplexer, costs $3,500. Univac can be reached at P.O. Box 500, Blue Bell, Pa. 19424.

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Modems Allow Data Transfer Between 3274 Control Units

ST. PAUL, Minn. — Interactive Systems/3M, Inc. has announced a modem series for communications between IBM 3274 control units and up to 32 remote terminals over a single RG-62-type coaxial cable.

The 3M Model 6600 series IBM attach modem is said to allow expansion of communications systems without additional new cables and ductwork and can be adapted from a baseband to a broadband configuration. Modems are available in 32-, 8- and 4-port configurations.

The 3M modems multiplex data from a group of controller ports into a single serial data stream which is transmitted in baseband fashion over a single — usually existing — cable, the vendor said. At remote locations, the data stream is demultiplexed back into the separate bit streams and distributed from there to each terminal over individual short runs of RG-62-type cable.

Prices range from $2,350 to $5,750 per unit depending on modem configuration, with multiple unit discounts available. More information can be obtained from Interactive Systems/3M, located at Department TL82-303, P.O. Box 33600, St. Paul, Minn. 55133.

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Bell Adds System to Gauge Dataphone II Performance

NEW YORK — The Bell System has announced e Performance Analysis System for users of its Dataphone II service.

The Performance Analysis System features e variety of reports that will reportedly aid customers in improving productivity through higher network availability. The heart of the service is e specially adapted Comm-Stor II communications storage unit. The storage unit collects fault indication data and test result data generated by a Dataphone II service network controller, the vendor said.

Using a Bell Dataspeed 40/2 terminal, a customer can select from 13 system menus to generate 36 different management reports. The reports can be printed out on an associated 43 Teleprinter or equivalent, the vendor said.

The performance Analysis System can only be used by customers with Level 3 Dataphone II service, Bell said. The system costs $690/mo.

Two Fully Buffered CRT Terminals Support Harris Supermini Family

FORT LAUDERDALE, Fla. — Harris Corp. has unveiled two fully buffered CRT terminals that support all standard features available on the entire family of Harris superminicomputers and provide specialized epplications.

The Model 8675 features character and line editing, memory and line locks and five special attributes: normal, reverse video, blink, underline, half intensity and security fields, according to the vendor. It costs $1,195.

The Model 8685 features 36 function keys and 20 programmable function keys in addition to RS-422 line interface, forms mode and printer port (RS-232 and RS-422). It costs $1,950.

Harris can be reached et 2101 W. Cyprus Creek Road, P.O. Box 6200, Fort Lauderdale, Fla. 33310..

Service Offered for Diablo 1600, 630

ROCHESTER, N.Y. — Xerox Corp. has announced that it will provide service options to customers who own its Diablo Sytems, Inc. 1600 and 630 series printers and terminals.

Service at the customer site will cost $660 annually for the 1600 series and $480 for the Model 630. Service will also be provided at Xerox Service Centers end customers can choose between bringing the units to the centers or having Xerox pick them up, the vendor said.

If e customer brings in his unit, the cost is $285 annually for the 1600 series end $175 annually for the Model 630. If Xerox picks up the equipment end returns it, the annual cost is $360 for the 1600 series and $250 for the Model 630, the vendor said.

Customers also can have their printers and terminals serviced at the centers and pay on a per-call basis. Nineteen Xerox service centers are in operation throughout the U.S. and 80 are expected to be open by mid-year, the vendor said.

More information can be obtained by contacting the Diablo Service Administration, Xerox Square, Location 837, Rochester, N.Y. 14644.

Module 581 Out For Model 580

SALT LAKE CITY, Utah — An add-on module has been announced here by Questronics, Inc. for use with its Model 500 Performance Monitoring System. The module — which offers host or remote site line-utilization activity-monitoring capability — supports Sperry Univac's Uniscope 100/200 polled synchronous telecommunications protocol, a spokesman said.

According to the vendor, the 581 Module can be physically connected locally on the data communications line or remotely for monitoring output of a specific multiplexer et the multiplexer (remote identifier). Statistical report printing for the module is self-contained within the Model 510 Controller/Printer Module, which can support up to 11 Model 581 Modules.

This configuration allows line-utilization monitoring of a maximum of 11 different telecommunications data lines, the spokesman said.

The Model 581 is designed to handle ell standard bit/sec rates from 300 bit/sec to 9,600 bit/sec. Data telecommunications lines interface is Standard RS-232C.

The Model 581 is priced at $850, e spokesman said from the firm et 3565 S. W. Tempie, No. 5, Salt Lake City, Utah 84115.

Graphics Units Aimed at Labs

TEWKSBURY, Mass. — Visual Technology, Inc. has unveiled two graphics CRT terminals designed for use in the laboratory, scientific and business markets.

The Visual 500 and Visual 550 graphics CRT terminals feature 768 by 585 resolution on 14-in. screens. Both emulete the Tektronix, Inc. Model 4010 and are compatible with standard business laboratory and scientific software, according to a spokesman.

Both terminals heve the following features: vector draw, point plot, rectangle draw, multiple line styles and patterns with rectangle pattern fill. They can also operate in alphenumeric mode, displaying 80 char. by 33 lines with separate alpha- and graphics-display memories, the vendor said.

The Visual 500 costs $2,495 and the Visual 550, $2,695, the vendor said from 540 Main St., Tewksbury, Mass. 01876.

PART I

TRADE SECRETS

By James Pooley

If you're a high-tech employer, you may have more proprietary technology than you think. Have you identified and protected your trade secrets?

If you're an employee, you may have considered starting your own company — and competing with your present employer. Do you know what ideas you can or cannot take with you?

In this two-part series, Silicon Valley-based attorney James Pooley offers solid advice on trade secrets — to keep both employers and employees out of court. This week: identifying trade secrets, and how to protect them.

IDEAS MEAN MONEY IN TOday's world, since industry relies on technology to improve productivity. Your ability to do well or even survive in the resulting highly competitive climate will largely depend on your success in acquiring, protecting and exploiting a piece of that technology.

Your competitive edge also depends on developing and protecting your business information, such as marketing studies, customer lists and the like. At the same time, these increasingly valuable ideas and "intellectual property" lie in the hands of a fairly mobile, independent and decreasingly loyal work force. The order of the day is the "split-off start-up," which means disgruntled or opportunistic employees (depending on your bias) leave to compete directly with their former employers.

Whether an employer or an employee, you must be armed with the knowledge of how to use and guard your ideas and how to thrive in the midst of this tumult. That is what trade secrets are all about and why reading this article should be important to you.

A central theme underlying this effort postulates that intellectual property, technology or "proprietary information" is an *asset*. In many ways this information resembles the raw materials used to make products, a firm's capital equipment, or plant or inventory on the shelf. It may or may not cost a lot to acquire (in fact, it may be discovered by accident), but proprietary information certainly is valuable and depreciates over time if not put to productive use.

You can use this material to pro-

From Trade Secrets: How to Protect Your Ideas and Assets, *by James Pooley, to be published this month. Copyright © 1982 McGraw-Hill, Inc. Used by permission of Osborne, McGraw-Hill, Berkeley, Calif.*

IN DEPTH

duce valuable goods or services, or turn it into cash by selling it to others to commercialize. And truer of intellectual property than of any other asset, it can easily be lost or stolen.

Among all the assets a business owns, its proprietary information may well be the most important. It can ameliorate the effect of today's soaring costs for labor, energy and raw materials on productivity and profitability. Now, more than at any time in our history, we must learn to cultivate and control our intellectual property.

At the same time, we must adjust to one frustrating aspect of technology that distinguishes it from other assets: it is often volatile and short-lived. This volatility results from the increasing pace of technological change, which often obsoletes perfectly good inventions before they can be brought to the marketplace. This circumstance probably will not improve. As most observers agree, technological advances are proceeding at an exponential pace. However, that does not mean that you should simply throw up your hands and forget about the whole mess. It does require you to be jealously protective of your proprietary information and to work fervently to capitalize on it as soon as possible.

Paradoxically, as technology becomes a more important and volatile asset, it becomes more expensive to produce. Computer software typifies this problem. While hardware engineering and production time is relatively short, preparing several hundred thousand lines of code is time-consuming and enormously expensive. Although scientists are developing computer systems that will create programs, until such artificial intelligence becomes available, software development will require this labor-intensive effort. Because it can be so easily copied, software exemplifies an extremely expensive type of intellectual property which requires careful, even fanatical, protection while its development costs are recouped through sales.

Also consider that the technological revolution has vastly increased the ease of communication and trade across state and national boundaries. One effect of this development is keener competition. Given relatively equivalent access to the raw materials of commerce, the success of most businesses will depend on their abilities to protect and exploit both their technology and other proprietary data. Unlike the days when a company's competitive advantage derived from its proximity to a railroad or a mine, today, a business is primarily distinguished from others by that proprietary data.

Mobile Work Force

Just as more businesses enjoy interstate and international trade, employees have also picked up their roots. Rising affluence and the acquisition of more generally applicable skills have made it easier for employees to move from place to place and from job to job. In many fields, employees now expect and want to move regularly, in contrast to earlier times when a successful career meant staying in one place. Now, we find an increasingly critical asset is placed in less controllable, less loyal hands. The need for special measures to protect that asset is apparent.

Technology has also made it easier for an employee to leave and compete directly with his former employer. Today small businesses are often created solely to trade on a specific new technological advantage that large companies, with their slower, more cumbersome organizations, cannot exploit. Extensive capital is often less of a problem. If you require and deserve it, financing is usually easy to get, apart from traditional bank funding.

And the rapid pace of change and simpler, more effective interstate communications have facilitated market penetration by even the smallest new enterprises. These developments present fabulous new opportunities for employees wanting to strike out on their own, and they also present serious, difficult challenges to the established employer.

This is not an article about industrial espionage per se. It does describe how to avoid simple carelessness, which causes significant trade secret losses. Too many businesses operate

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Dresser Industries, Inc. is offering a unique opportunity for a company or organization to acquire a large working computer center, complete with two IBM 3033 Central Processors and associated peripheral equipment.

The computer center is located in Pittsburgh, Pennsylvania. The building has 25,000 square feet (including 11,000 square feet of raised floor) and has uninterruptible power, all electrical equipment for a large processing facility, air conditioning (for water and air), fire and security protection systems, and office accommodations for a staff of 160.

The computer center presently serves more than 100 Dresser operations in the United States, Canada and ten foreign countries with 2,000 remote job entry and on-line interactive terminals running around the clock.

Dresser is building and equipping a new computer center in Dallas, Texas and proposes to sell or lease the Pittsburgh center as a complete and working center. Detailed specifications on the building, utilities and computer equipment are available to interested parties.

Sales agents and broker inquiries are invited. For information and specifications, contact:

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like banks that not only leave the doors unlocked, but display the combination to the safe throughout the lobby. Most businesses and individuals are woefully negligent in not *identifying* and *protecting* their trade secrets, the two initial steps required to turn those assets into dollars.

Generally speaking, proprietary information is simply "commercially useful" ideas. We are not concerned here with novelty or obviousness, considerations that arise with patents. However, if you expect anything to be "proprietary," whether it is technological data or customer in-

What Is Proprietary Information?

Not knowing what constitutes proprietary information was certainly one way many entrepreneurs may have lost their valuable technology in the past. Although the following is a hypothetical story, it is representative of the learning process that many have faced in their early struggles with information protection.

At Electron Products, Ed Pascal was a technical genius. He created the company's most important product and continued to lead an ambitious research and development program. Like many engineers, Ed was fiercely proud of his work and had been logging his daily brainstorms, complete with sketches and meeting notes, in a series of notebooks. In his career, he had worked for four companies, taking his expanding library with him on each move. He commanded a lot of respect from his co-workers and had personally recruited many of them from his last job. Ed had been with Electron for three years.

Dick Tindall also worked at Electron as its regional marketing director. He had been with the company longer than Ed, almost from the beginning, and had contributed to its excellent sales growth. His performance was motivated largely by a commission plan, which had paid him handsomely in the last couple of years, once he had struggled through the start-up phase. Recently, however, management revised the commission plan. In plain terms, he was making too much money. His sales quota was increased, and greater increases were implied to keep his overall compensation "within reason."

As Dick was becoming disenchanted with the ever-advancing carrot at the end of the stick, Ed was shocked to find one of his most significant product proposals rejected by his new manager, Stan Holland, in favor of an idea advanced by a crony brought along by Stan from his last employer. The decision was a bold move by Stan, whose department had recently missed some critical goals, to prove himself to his superiors.

Ed and Dick had often engaged in the kind of idle talk that occurs at after-hours company functions, discussing their thoughts about controlling their own destinies or getting a bigger piece of the action. Now, the talk became more serious.

Each decided the time had come to leave and start a business in competition with Electron. After all, Ed was an expert in his field and knew that his rejected idea was a real winner. To the extent Dick understood it, he agreed and felt that with the industry connections he had built up over the years, he could easily sell the product. With this initial success, the inevitable growth of their new enterprise could be staffed with the best people now working for them at Electron.

Unexpected Development

They both left their jobs, taking with them not only their experience and talent, but also Ed's notebooks and Dick's Rolodex of the business contacts he had developed. Neither had signed any contract with Electron. Therefore, they were astounded to be served with a lawsuit alleging their "theft" of Electron's "trade secrets" and "proprietary information."

The litigation had been generated by Stan, who was concerned that some of Ed's friends might leave to join the new company and who needed a convenient scapegoat for his department's recent failings. The legal fight was extremely bitter. Each side incurred expensive legal fees and lost invaluable time. In the end, there was no real winner. Other competition, undiverted by legal battles, overtook them both.

Although this grim, frustrating account is not true, it is an amalgam of several real "trade secret" cases. Both sides entered litigation and lost to each other because they were basically ignorant on the subject of "proprietary information." Electron had never established a system to identify and protect the basic technology and business information that it needed to keep secret from the outside world. And Ed and Dick never considered whether what they took away on paper and in their heads was really theirs to take.

With some basic education, such as that provided in this article, employers and employees can stay out of court on these disputes or, where that is not possible, prepare for the fight and maximize their chances of winning it. Since the fight concerns proprietary information, exploring what that means is of primary importance.

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IN DEPTH

formation, it must at least not be generally known.

The phrase "commercially useful" is used here to mean eliminating information of academic interest only. That distinction may be obvious, however, since most innovators probably spend little time on nonprofitable information. Capitalism has a way of turning most good ideas into money, if properly treated.

If you run a business, proprietary information or intellectual property consists of any data that helps sell your product or increase your revenues or profits. A chemical formula, a manufacturing process, a customer list or an analysis of your competition suggest just a few examples. From an individual's point of view, proprietary information refers to anything that embodies an idea you can sell to a business or turn into a business.

Whether you make potato chips or silicon chips, whether you sell soap or computer time, you probably own far more proprietary information than you think. The most seemingly trivial things can qualify. The method you use for figuring your bids or running your conveyor belts, or your knowledge of an important customer's favorite cigar, may seem relatively unimportant to you.

You may have spent little or no money or effort obtaining the information. Indeed, you may have discovered it by chance. However, it is yours, and it gives you an advantage over your competition. Unless you're in the unusual position of being a monopoly, you can't afford to dissipate that asset by giving it away to your competitors or by simply letting it rot in your "inventory."

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Technology and Business

Proprietary information includes *technology* and *business information*. These categories reflect the distinct problems or opportunities that arise in this area. Also, this division is helpful once you have identified your proprietary information and begin to consider the most appropriate methods of protecting and utilizing it.

Technology may consist of a machine, design, formula or method of manufacture. You may already understand what constitutes patentable material. However, don't be confused. Although all patentable matter falls generally within the "technology" category of proprietary information, the reverse is not true. In fact, an enormous universe of ideas (such as "know-how") is not patentable, but can qualify as proprietary information. And that universe expands daily.

Proprietary technology is distinguished from business information in part by its general application to a class of businesses. Examples include a method of mixing structural concrete, an electronic circuit diagram, computer software and a chef's pastry recipe.

Proprietary business information specifies how you make and plan to make money. While it does not necessarily apply to other businesses, knowing it could help them compete more effectively against your business. Examples include an employee list, a customer list, a description of employee benefits and a marketing plan.

Stop reading for at least five or 10 minutes and recall some less obvious examples of these two general areas in your own business. As soon as possible, assemble an exhaustive list of the technology and business information that is proprietary to your business or department. Remember that "proprietary" means it is yours. However, it does not have to be exclusively yours, as long as it is not widely known like a principle of physics or mathematics. Consider, also, that many otherwise obvious or generally known ideas may be part of a unique or unusual combination that your proprietary information contains.

Unfortunately, there are no consulting services available to help you identify your intellectual property assets. However, this article should help develop your understanding of the subject.

The First Step

To identify your proprietary information, review your company, division or department and analyze what

you make or provide and how you go about making and marketing it. Then consider methodologies that may differ from your competition and the data or processes you would not want the competition to have or know.

Next, break this technology and business information into categories. Develop an inventory scheme for your business. Join your other managers and direct them to perform the same analysis.

This first step of identifying your proprietary information is the most difficult one. You will use this analysis to formulate and effectuate a policy for protecting, exploiting and maximizing the usefulness of your trade secrets. More likely than not, you will be light-years ahead of your competition. Several of the largest high-technology firms in the Silicon Valley of Northern California have not performed this analysis. If you don't do it, you are at best being inefficient; at worst, you run a substantial risk of losing your most important assets.

Ownership Issue

Of course, as you list the things you own, you must develop some method of deciding what really does belong to you. This issue arises almost exclusively with respect to technology. Often the question involves the rights of the employer vs. the employee concerning an invention of the employee. This is a critical question if you are an employee who has developed a product or process in your spare time and now wonder how to capitalize on it without losing your job or getting sued.

In general (the specific laws vary from state to state), three situations are possible. They reflect the nature of the employee's duties and what is used to develop the invention. First, if the employee is *hired to invent* and the discovery falls within the assigned work area, then the idea will normally belong to the emptoyer, since the invention simply fulfilled the job requirements.

Second, if the employee was not hired to invent, or if the discovery is outside the scope of the assigned duties, but the employer's resources are used to produce the invention, then the employer has a *shop right* to the idea. This is the equivalent of a non-exclusive, royalty-free license to use, but not to sell the idea. The employee has all remaining rights to the idea. Thus, a stockroom clerk who discovers a new and more efficient type of pallet will own the rights to that invention, subject to the employer's shop right.

Finally, when the employee discovers an invention without using the employer's resources and it is not considered within the "hired" duties, the invention betongs exclusively to the employee. However, this assumes that the employee devetoped the invention without using any trade secrets or other proprietary information belonging to the employer.

This is distinct from the "resources" referenced in connection with the shop right, which consist of the non-unique, tangible assets of the employer, such as raw materials, time, facilities and so on. So, if an employee creates an invention that either incorporates or in some way uses the employer's exclusive, proprietary data, then the issue of ownership is less clear and requires legal assistance to unravel.

The issue of ownership may also be affected by special rules or statutes peculiar to individual states. In California, for example, a recently enacted law provides that employees retain all rights to any invention created on their own time without use of their employer's facilities or proprietary information.

Contracts can also make a difference. A properly worded employment contract can require an employee to assign all inventions, patentable or not, that are created during the employment period. However, the construction and enforceability of such contracts vary from state to state, and you will probably require some legal advice if this issue applies to you.

A final point relates to the widespread misconception that individuals "own" whatever is in their heads. This is not true; an employer's proprietary information, whether it

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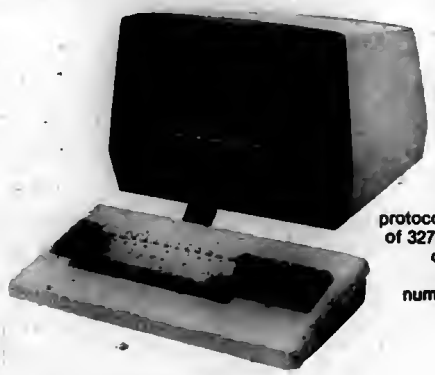

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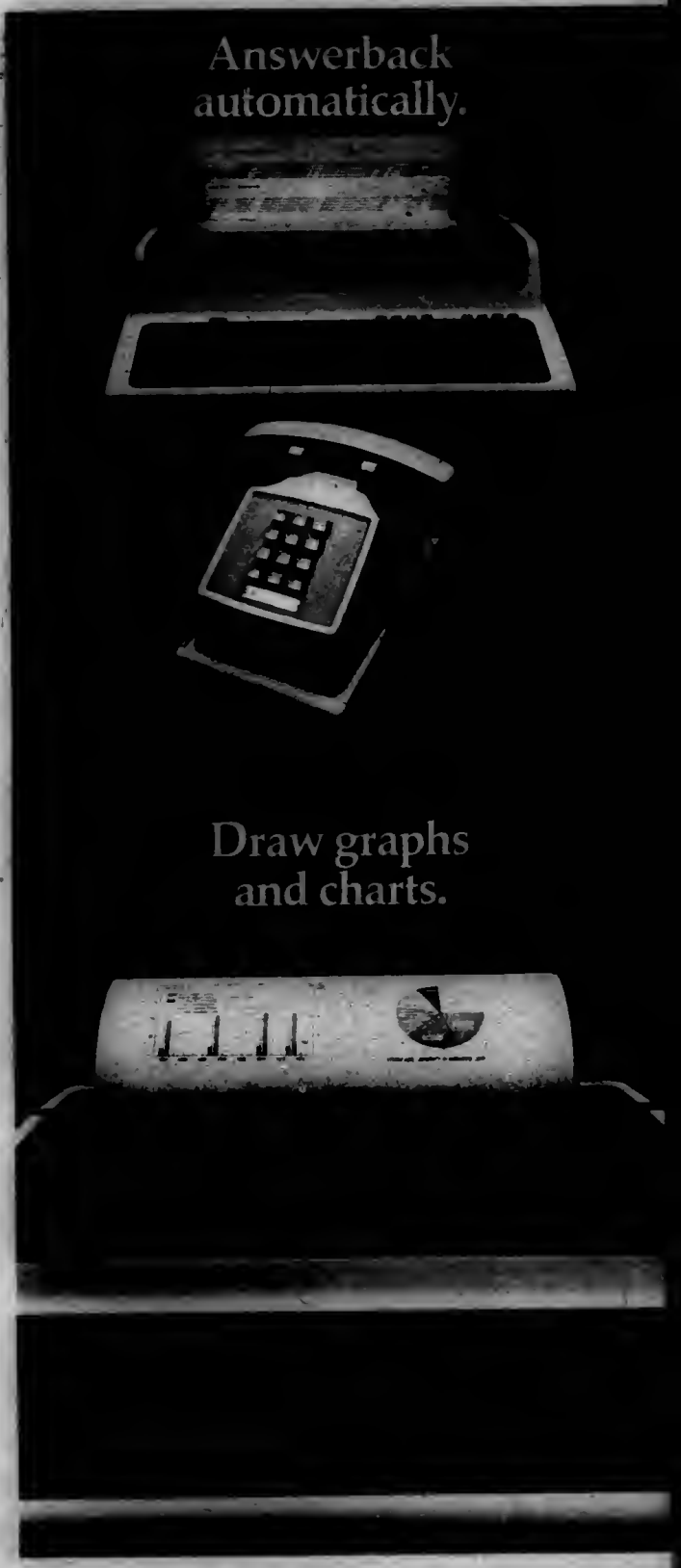

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IN DEPTH

is a customer list or a secret manufacturing process, cannot be used by the employee after terminating employment, even if the information is unwritten and stored in the employee's head. However, an employee can keep and freely use any general knowledge or skills acquired on the job. Like many distinctions, this one is far easier to state than it is to apply.

Nevertheless, this standard is almost universally used in deciding what information exclusively belongs to the employer and what information the employee may take and use. How this concept is applied to the more common areas of dispute between employer and former employee will be explored in some detail later.

Trade Secrets

Unlike patents and copyrights, the concept of trade secrets is not a creation of the statute books. Moreover, because it is defined separately by each state, the law of trade secrets will vary from one jurisdiction to another. (A Uniform Trade Secrets Act has been proposed to the states, but has yet to be adopted.) Trade secret law has been created by the courts in an effort to establish rules for "fair competition" among businesses. And because of its judicial genesis, it is flexible enough to cover an enormous range of ideas, inventions and other business information.

A trade secret is often generally defined as any formula, pattern, device or compilation of information used in a business that gives the owner an advantage over competitors who neither know of nor use it. Although this description is necessarily vague, keep in mind that your own trade secrets should be reasonably specific. You must be able to describe what it is that you claim as a trade secret. Without a precise description, you cannot prepare an appropriate plan to protect it or expect others to respect your rights. Moreover, the courts will not recognize trade secret claims that are not sufficiently specific.

As you might conclude from this definition, almost anything can qualify as a trade secret, from complex circuit designs to Colonel Sanders' "secret blend of 11 herbs and spices." Examples of trade secrets the courts have recognized include:

- A soft drink formula (for example, Coca-Cola®; its formula is perhaps the most famous trade secret).
- A rat poison formula.
- A process for extracting alcohol from empty whisky barrels.
- A method of flavoring mouthwash.
- A process of manufacturing orchestral cymbals (this one has been maintained as a secret within one family for hundreds of years).
- The seminar technique of a group nonsmoking clinic.
- Designs for automatic toll-collection equipment.
- Customer lists.
- Computer software.
- New product plans.
- Advertising plans.
- Cost and pricing data.
- Employee benefit information.

A trade secret also differs from a patent or a copyright, since the idea or invention represented need not be unique to the owner. Several competitors in the same market might each have come to possess the same trade secret through independent development. It is a factual question whether a trade secret may become a commonly known industry practice over time, in which case the trade secret status is lost (see figure on facing page).

An idea need not be patentable in order to receive trade secret protection, nor is novelty a strict requirement, although some courts are more likely to grant protection to a novel invention. This is especially true in cases where no demonstrable fraud or breach of trust exists. This is the important distinction: A trade secret is not limited to patentable subject matter (machines, processes, compositions of material and articles of manufacture), but extends to cover virtually the entire range of "know-how" and business practices.

How Courts Rule

How do you know whether your information qualifies as a trade secret? Although the definition provided earlier in this discussion

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TRADE SECRETS – PART 1

IN DEPTH

is the best shorthand answer, the courts consider several factors in deciding whether any given item of intellectual property qualifies. These factors are posed in the following questions:

• *How extensively was the matter disclosed in a patent?* To that extent, it is normally deemed public information and the courts will not prohibit others from using it. This is critical if you are considering seeking patent protection for certain portions of your technology while treating the remainder as trade secrets. Patent applications must be written with enough detail to enable a person of ordinary skill in the field to duplicate the invention just by reading the patent. If you omit information necessary to describe the invention's "best mode of use," you may invalidate any patent you receive.

For instance, you might describe a broad temperature range in a process, when you know the best results are obtained in a specific, narrower range. But the more information you include, the more likely you are to compromise the trade secret status of details you wish to maintain as a secret. This potential dilemma requires close and continuing attention in the management of your intellectual property. Of course, while the patent is pending (two to three years), you still have your trade secret protection. It is only lost when the patent is granted and published.

• *How extensively is the information known outside your company?* This is an extremely critical factor. In the best circumstance, of course, proprietary information is not known at all. However, it is frequently necessary to reveal proprietary information to customers, vendors, the government and others. Even if strict measures have been taken to prevent wholesale distribution of the information, the fact that several sources outside the company know it reflects negatively. As a general rule, the more the information has been distributed, the more protective measures a court will want to see adopted before conferring trade secret status.

• *How extensively is the information known among employees within the company?* At one end of the spectrum, a manufacturer maintains a secret formula by imparting distinct portions of the formula to a few trusted employees. At the other end, a business makes otherwise secret information accessible to large numbers of employees, none of whom could adequately justify their need to know.

• *What measures have been taken to guard the secrecy of the information?* This is the single most important consideration. Significant amounts of time, energy and money are invested to determine whether the secret holder took reasonable steps to protect the secret from unauthorized disclosure or use. However, qualification for trade secret protection does not require running your business like the Central Intelligence Agency.

Instead, the court applies a more flexible standard: "reasonable" measures must be taken to protect the information. As a general rule, the more important and sensitive the information is, the greater the protection effort required for trade secret status to apply.

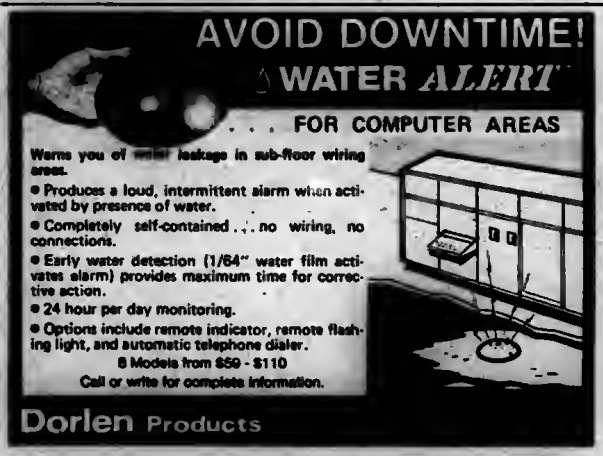
• *How easily can the information be independently acquired or duplicated?* This often becomes the critical factor in a "customer list" case, where the former employee is charged with unfair solicitation of the former employer's customers. The perfect defense would show how you created your own list from scratch, using publicly available sources.

With respect to a manufactured article, the courts will consider whether it can be "reverse-engineered." In technology trade secret cases, a sufficient defense shows that you developed a similar article simply by disassembling the plaintiff's product to determine its components and design. The underlying idea assumes there is nothing unfair about simply

'A trade secret is not limited to patentable subject matter (machines, processes, compositions of material and articles of manufacture), but extends to cover virtually the entire range of "know-how" and business practices.'

	Patent	Trade Secret
Subject Matter	Specific and limited by statute (machines, articles of manufacture, processes and composition of matter).	Applies to broad range of intellectual property and business information.
Requirements	Must be useful. Must be novel. Must not be obvious.	Must provide competitive advantage. Must not be generally known. Must be kept secret.
Definition	Defined strictly by language of the "claims."	Often difficult to define with equal precision, but can be as broad as the "equities" of a particular case require.
Disclosure	Required.	Any disclosure must be limited and controlled.
Protection	Defined by narrow but specific statute.	Varies depending on circumstances and court based on many theories.
	Can prohibit use by anyone else.	Protection only against "unfair" users; none against those who independently discover or reverse-engineer.
Duration	Seventeen years from issuance.	Potentially unlimited as long as secret.
Expense	Procuring policing infringement.	Protecting from unauthorized disclosure or use.
Risk	Invalidity.	Independent discovery or inadvertent disclosure.
Marketability	Licensing easier.	Licensing more difficult and requires policing of licensee security measures.

Comparison of Patent vs. Trade Secret



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IN DEPTH

copying what you can see, even if you must disassemble it to do it (assuming, of course, no patent or copyright infringement). Thus, the supposed secret is not really a secret at all.

Even if the defendant did not reverse-engineer the article, but "unfairly" developed it by hiring away one of the plaintiff's designers, it is sometimes sufficient to show that the article could have been reverse-engineered. This may convince the judge that the claimed proprietary information was not a real secret. Or, it may result in an injunction against using the secret for the period of time that it would otherwise have taken to reverse-engineer the item.

• *How much money was spent in developing the information?* The dollar value of the development process is often one of the most significant factors. Although many judges may find many of the concepts of intellectual property difficult and the technology unfamiliar, one thing they all understand is money.

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TRADE SECRETS — PART 1

IN DEPTH

If you can demonstrate that an improper use or disclosure of the secret will cost your business tens or hundreds of thousands of dollars in lost revenue, you will have the judge's attention. And if you can show that you spent significant money to develop the secret — an investment that would be lost forever without an injunction — you will almost always have the judge on your side. For your most important, easily identifiable items of intellectual property, maintain an accounting system that will permit you to recover this type of information quickly and accurately.

• *How novel is the secret?* Although novelty is not a necessary component of a trade secret, in practice it will influence the court's decision. Thus, you should examine the uniqueness of your secret and write the best English description of it you can.

• *How specifically can the secret be described?* Courts normally will not (and should not) issue injunctions against using "ABC Company's trade secrets or confidential information." The phrase is too ambiguous for the defendant to understand what can and cannot be done. Therefore, before you can expect the court to protect your secret, you must be able to articulate clearly what it is.

• *Does the secret include employee "general knowledge"?* As discussed above, a company's proprietary information does not include the general knowledge possessed by each employee concerning how he performs the job. Therefore, you cannot claim this type of information as a trade secret.

• *How extensively would an injunction inhibit the employee from pursuing a chosen career?* If you required an employee to work almost exclusively with proprietary information, absolute protection of that information would require prohibiting the individual from any subsequent work for competitors. However, the courts are sensitive to the anticompetitive effect of such rulings, since they tend to make an individual defendant essentially unemployable.

Do not involve an employee so exclusively in secret work that he cannot find any subsequent employment without using it.

Legal Problems

If these broad definitions and complex factors have only created more confusion, you have accurately assessed a basic problem of trade secret law: It is extremely difficult to determine exactly what constitutes a trade secret.

This difficulty evolves from the courts' attempts to pigeonhole trade secret law into certain traditional legal fields.

For instance, many judges and lawyers first treated the subject as property and applied rules concerning ownership, definition and theft of personal property to the developing concepts in intellectual property. Other courts emphasized the confidential relationship between the parties. In fact, such relationships weigh significantly in many cases. Other courts stressed contractual obligations against disclosing or using certain information.

Cause for Optimism

More recently, many judges have supported the law of trade secret protection as simply an ad hoc effort to enforce commercial morality. Rather than basing protection on outdated or inapplicable principles of contract or property law, many judges realize the history of trade secret litigation requires they follow their own visceral reactions.

This is a positive development. A system that considers all the facts and circumstances in light of certain established but not necessarily controlling principles will be beneficial. With the quickening pace of technological change and the rapid-fire transactions that characterize modern commerce, anything less flexible would not work in the long run. But whether or not you agree, consider a trade secret as a religion; If you believe you have it and you act like you have it, then you've probably got it.

Appearances often determine who wins or loses a trade secret contest. Therefore, in qualifying a protectable trade secret, considering how you can make it look is as important as considering what it is.

About the Author

A lawyer practicing in the Silicon Valley of Northern California, James Pooley has primarily represented high-technology firms involved in trade secrets and unfair competition litigation. He is a partner in the firm of Mosher, Pooley, Sullivan and Hendren.

Pooley received his undergraduate education at Lafayette College and the University of Paris and his law degree from Columbia University. He has served as a faculty member of the Hastings College of Trial and Appellate Advocacy and as lecturer for the University of California's Continuing Education of the Bar.

He currently chairs the Lawyers Committee of the American Electronics Association.‡

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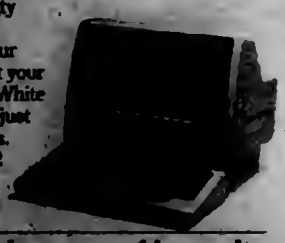

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PROFITABILITY AND THE HUMAN RESOURCE SYSTEM

The profitability of data processing systems, as with any company asset, must be measured in terms of return-on-investment (ROI). A company should clearly document ROI before undertaking any system development project — large or small.

Data processors have several tools with which to document a system's ROI. Cost/benefit analysis, feasibility studies and benchmark tests are all ways to measure the cost-effectiveness of hardware and software.

The cost of an automated application can be determined by estimating system development costs and yearly maintenance costs after the system is implemented. Hundreds of publications are available on the subject of planning and estimating system costs. However, measuring system benefits (especially intangible ones) can be a much more formidable task.

The benefits of a computer application can be defined in terms of tangible, intangible, direct or indirect benefits. If it can be proven that a system will provide a particular benefit to the company and this benefit can be easily estimated in terms of dollars, then this benefit is tangible. An intangible benefit is one whose value cannot be substantiated in terms of dollar savings to the company. By direct benefits, we mean those cost savings or increased earnings that can be realized immediately as a result of implementing the system. By indirect benefits, we mean those cost savings or increased earnings that can be realized:

- After the system has been implemented for a long period of time, or
- Because of the beneficial impact on the profitability of other manual or automated systems as a result of implementating the system.

Let's use an automated inventory allocation system as an example (see figure on In Depth/17). One of the obvious benefits of an effective inventory system would be a reduction in the square footage required for storing merchandise. Any company should be able to cost a square foot of warehouse storage space accurately. Thus, this benefit would be categorized as tangible-direct, since it could be realized imme-

BY BILL DURELL

IN DEPTH

diately upon implementation of the system.

A tangible-indirect benefit would be a long-term benefit that can be accurately estimated. The benefit realized from a delay or reduction in future warehouse construction would be an example of a tangible-indirect benefit. Another benefit would be a reduction in the amount of merchandise erroneously shipped from the warehouse. Although this reduction would be realized immediately upon implementation, an accurate estimate of the savings in dollars would be extremely difficult. Thus, this benefit would qualify as intangible-direct.

Finally, an improved inventory system has the potential to increase future sales by providing faster and more accurate allocation of merchandise to the buying public. This is an intangible-indirect benefit.

Benefits can be assigned the following values, in order of importance:

1. Tangible-direct.
2. Tangible-indirect.
3. Intangible-direct.
4. Intangible-indirect.

Necessary Comparison

But the benefits of any system cannot be measured in terms of a single application. We must define the benefits of an automated inventory system and then compare these factors against those of an automated general ledger or a human resource system. By doing so, we can measure not only the benefits of an inventory system, but also the cost of not gaining the benefits of a general ledger system or of not realizing the benefits of a human resource system.

Of course, we must compare both tangible and intangible benefits among those applications competing for system development resources. Comparing tangible benefits is simply a matter of totaling dollar amounts. Intangible factors can be compared by assigning a relative weight (importance) to each benefit and comparing total quantities of intangible units among applications. Although intangible benefits cannot be measured in absolute terms, they can be in relative ones.

Thus, to measure the value of any one application effectively, we must compare it with the value of all other DP systems needed by a corporation.

Human Resource System

Let's examine some of the more important aspects of a human resource system and compare them with those of other systems.

The most significant benefit of any payroll system is its potential to reduce wage costs. The average nonfarm employer in the U.S. allocates more than 65% of total expenses for employee compensation. Thus, the human resource system affects more corporate expenses than all other DP systems combined.

The cost of employee fringe benefits, as a percentage of total wage expenses, has shown a steady increase over the last two decades. Also, these nonproductive wage costs will increase even more as a result of increased pension costs via longer employee life span. By the year 2000,

'Compensating an employee with extra cash for fringes not taken can give you a competitive edge over other employers. In addition, accurate salary survey data can make payroll administration more equitable within a company and can help reduce the loss of employees to competitors.'

more than 34% of our population will be between the ages of 40 and 69. Thus, tangible benefits gained from the control of wage costs become increasingly important.

Many companies have found that a payroll system with a fringe benefit package tailored to individual employees can make a salary package more attractive without increasing wage costs. Compensation packages must be flexible enough so they are meaningful for each employee within the context of his own life-style. There is no reason for a 25-year-old single employee to be restricted to the same fringe-benefit options as a 55-year-old married employee with four dependents.

Compensating an employee with extra cash for fringes not taken can give you a competitive edge over other employers. In addition, accurate salary survey data can make payroll administration more equitable within a company and can help reduce the loss of employees to competitors. Although it would be difficult to measure accurately the benefits derived from a more competitive salary package, a reduction of employee turnover would be some indication of its value.

Small Margin for Error

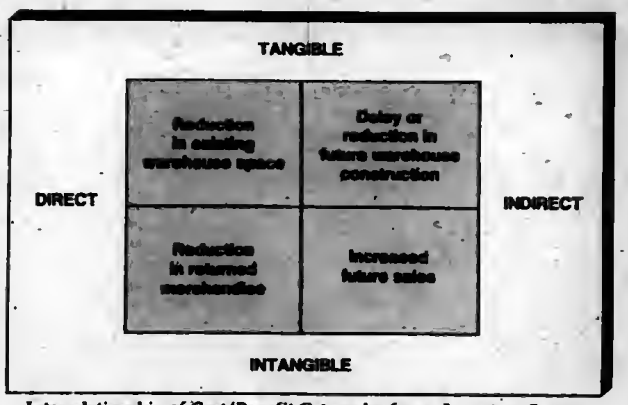
It would be relatively easy to prove the importance (or value) of a payroll system. A simple test would be to print paychecks one day late because bugs were encountered in changes in the check-printing routine. No one will deny the adverse impact on employee moral (and thus productivity) from a missed payday. Thus, with a payroll system, we have the potential for a significant "negative" benefit.

Unlike other systems, there is little room for error in payroll processing. The difference between a perfect processing run and a "99% correct" run is very large. A "small" bug in a payroll run is a rarity indeed. Try explaining to employees why paychecks will be "slightly" late.

Any disaster recovery scheme without contingency payroll processing plans is not worth the paper on which it is documented. Most companies would consider payroll the number one priority while processing during emergency situations. Thus, the consequences of an erroneous payroll run are considerably more detrimental than the incorrect processing of most other applications.

We have briefly analyzed some benefits of a payroll application. Now let's discuss the other half of a human resource application — the personnel system.

Certainly, a good personnel system will have a positive effect on employee motivation and thus productivity.



Interrelationship of Cost/Benefit Categories for an Inventory System

Some of the benefits of a personnel system include the following:

1. Employee morale and job satisfaction can be increased by filling vacancies via an automated search of candidates across a companywide data base. For large companies, maintaining an automated skills inventory for employees is the only practical way to search for position replacements. Finding the right person for the right job can improve the bottom line of any company.
2. Labor and union relations can be improved by providing accurate employee data to assist in contract negotiation and settlements.
3. Applicant flow and career development processing can improve the likelihood of employee satisfaction by providing steady growth and challenge to employees.

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4. Accurate wage history data can assure an employer that an employee is being paid at a rate commensurate with ability.

All of these benefits not only have the potential to improve productivity, but also can reduce employee turnover. Because of the increased use of DP and other sophisticated equipment, the costs of employee training and turnover are increasing with the rate of technological advances. Many would argue that the cost of turnover cannot be measured (thus, is "intangible"). However, the cost of employee turnover can be measured as the total of the following:

1. Increased cost of unemployment insurance as a result of increased turnover.
2. Cost of unemployment litigation.
3. Severance pay.
4. Education and training costs for replacement employees.
5. Loss of productivity as a result of having to train replacement employees.

Although it is impossible to estimate accurately the potential reduction in employee turnover from an effective personnel system, a conservative estimate of 1% reduction could mean a significant dollar savings for a large corporation.

Thus, the human resource application must be evaluated on its immediate and potential impact on the greatest asset and liability of any corporation — its personnel. Of all automated applications, the human resource system has the greatest influence on the factor that can most significantly affect a company's profitability — the employee.

By answering the following two questions, you can determine the benefits of the human resource system to your corporation:

1. How direct is the link between personnel and profit in this company?
2. How can a human resource system strengthen this link?

Bill Durell has written on a number of DP-related topics. Among his professional accomplishments, he was most recently a project leader for the data processing division of a major shoe retailer. In that position, he was responsible for directing the development of a nationwide payroll/personnel system for 2,500 stores.

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Whetstone Still Foundation

Benchmarks Changing as Systems Mature

By David Saunders
Special to CW‡

Comparing different computer systems is not unlike trying to weigh the differences between apples and oranges. No matter how similar, each computer has its own inherent differences that makes it difficult to match it against another machine.

In order to offer some degree of comparison, the majority of computer manufacturers — particularly those in the scientific processing arena — have adopted Whetstone numbers to rate their machines.

Basically, the Whetstone values are based on how well the computer performs using a standard benchmark program. These values are usually expressed in terms of single or double-precision numbers, each representing a different degree of exactness.

However, although single benchmarks have served the computing community well over the past decade, new techniques are needed to thoroughly compare today's machines. While the Whetstone is still valuable as a basic measurement, recent technologies such as cache memory, writable control store and software optimizers have added new variables to an already debatable rating method.

The 'Venerable' Whetstone

First, a bit of history of the venerable Whetstone. Contrary to expectation, the Whetstone was not created at a place called Whetstone. In fact, it was developed at the National Physical Laboratory at Teddington, England, just outside London near Heathrow Airport.

Its name actually derives from an Algol interpreter developed 20 years ago at the English Electric (now part of the General Electric Co. of England) facility at Whetstone, which is located in the English Midlands.

Originally, the Whetstone program was intended to compare different language systems on the same computer. But it became quickly apparent that the impact of the source language was dwarfed by the impact of the translation techniques employed.

For example, an interpreter did not

(Continued on Page 64)

Micro-Based Cluster Controller Runs 48 Devices, 31 Terminals

BLUE BELL, Pa. — Sperry Univac has introduced a microprocessor-based cluster controller designed to handle up to 31 workstations and 48 peripheral devices in a real-time, on-line interactive local or distributed processing mode.

A member of Univac's UTS 4000 terminal family, the UTS 4040 offers increased programmable memory and can support more workstations and peripherals than normally can be attached to a single controller, a spokesman said.

The UTS 4040 is geared for sophisticated distributed processing, especially for such functions as interactive data entry under local program control, maintenance of local diskette files, report generation, data batching, local Cobol processing and host queries.

The 4040 has a maximum of 512K bytes of read/write random access memory; data storage is on double-sided, double-density diskettes. The device offers data transmission speeds of up to 19.2K bit/sec.

The controller's basic components and expansion features consist of a processor, a 1M-byte integral diskette load device, a power supply, a communications interface, 64K-byte memory modules, a workstation interface to attach up to four UTS 20W- or two UTS 40W CRT stations, up to seven additional workstation interfaces and up to six 8-bit and/or dual 8-bit peripheral interfaces, the spokesman noted.

Each byte-addressable 22-bit word in main storage consists of 16 data bits and six error correction code bits. Data transfers between the peripherals and the 4040's main memory are performed under the control of the system's dedicated microprocessors. When not under program control, each of the user's CRT workstations are said to retain all properties of an interactive on-line to Univac mainframes.

Software support for distributed processing includes a system control program that supports concurrent user applications and diskette file management; UTS Cobol, which is a subset of Ansi X.3.23-1974; an interactive program generator; an edit processor; a loadable character set generator; and a text processing utility that allows users to create, modify, format and print textual material and later transmit it to a host processor.

The controller's microprocessor provides separate 32-bit registers for each processor "state," which provides a degree of security since one user program is effectively isolated from another as well as from the device's system software. Keylocks prevent unauthorized user access.

UTS 400 Cobol users can migrate to the 4040 without any software modification because of the controller's system control program, Univac said.

The cluster controller will be available in May for $11,520. It can also be leased for $382/mo, including maintenance.

Sperry Institutes Selected Price Hikes, Cites Inflationary Cost Pressures

BLUE BELL, Pa. — Citing inflationary cost pressures, Sperry Univac has increased rental and lease prices for selected computer equipment including peripherals, terminals and program products.

At the same time, the firm also raised maintenance prices and customer service charges on a variety of its equipment.

Effective April 1, prices will be raised by 8% on the firm's 8450, 8434, 8433, 8430, 8416 and 8413 disk drives, the Uniservo 10, 14, 16 and 29 magnetic tape drives and some card readers and printers, a spokesman said.

In addition, Univac will boost rental and lease prices by about 7% on its UTS 4000 family of terminals and by 5% on the purchase price of the UTS 10 terminal. Rental and lease prices for the System 80 computer CPU and main storage will also be hiked by about 5%, he noted.

In the software area, all OS/3 operating system program products, systems support and applications programs, as well as UTS-4000 program products will be increased by 10%.

Finally, the firm will raise by 10% the hourly rates charged for customer engineering and systems services and will hike maintenance prices on a number of its products from 5% to 10%, depending on the equipment.

Additional information on Univac's revamped pricing structure can be obtained from the firm's headquarters at P.O. Box 500, Blue Bell, Pa. 19424.

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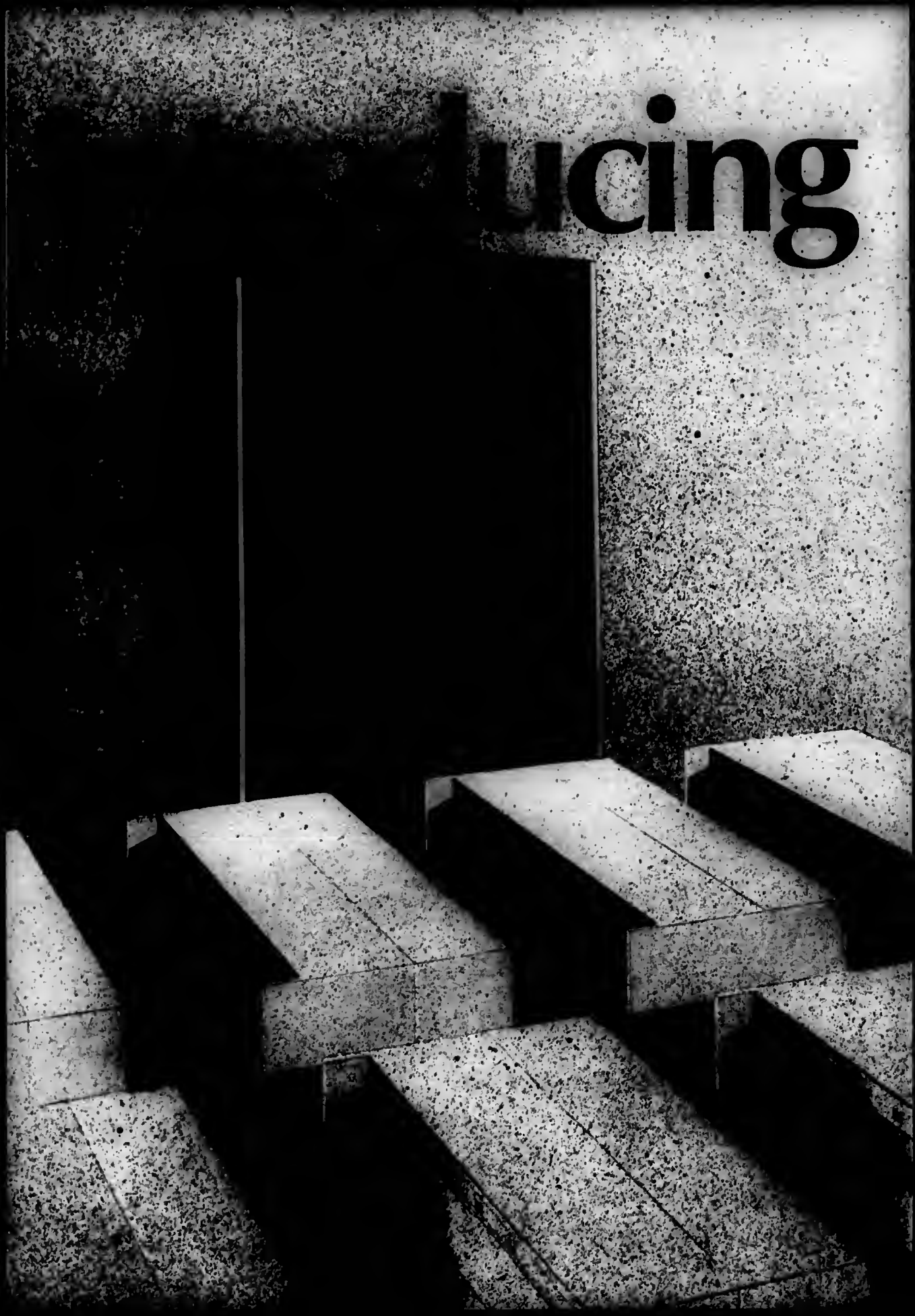
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Coupled with STC's current family of 8350, 8650 and 8360 disk drives, Sybercache delivers the I/O response and transfer rates demanded by today's fastest processors.

As STC's new generation 8380 drives come on line, Sybercache will deliver even more performance for still greater productivity.

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By alleviating path queuing problems, eliminating mechanical delay and driving transfers at full channel speeds, Sybercache reduces I/O times by as much as 75%.

Central to its performance is the Sybercache manager–a fast microcomputer that evaluates host channel programs then directs data flow according to the performance needs of each data set. It determines which operations should be directed to disk, which to cache, and how much buffer space each requires–on a case-by-case basis.

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Sybercache is fully hardware and software compatible with 4341, 370/135-168, 3031-3081, or equivalent CPUs. And since the cache manager handles most tuning needs automatically, implementation is straightforward.

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'Domain' Gets Performance Enhancement

CHELMSFORD, Mass. — Apollo Computer, Inc. has announced a single-board performance enhancement for its 32-bit Domain distributed operating multiaccess computer network system that adds both a cache memory and floating-point processor.

The Performance Enhancement Board (PEB) is hardware- and software-compatible with the firm's current products and is said to provide performance improvements ranging from 50% to 400%, depending on the user's applications. The device can be factory or field installed.

The board's cache memory acts as a high-speed buffer between main memory and the central processor. This buffer reduces the average memory cycle time, allowing the processor to spend less time waiting for instruction and data fetches from main memory. The four-way set associative cache retains the least recently used information to achieve a cache hit-rate of about 90%, a spokesman claimed.

The floating-point processor, which uses 2,900 bit-slice technology, was designed to conform with the proposed IEEE floating-point standard. In addition to the traditional single (32-bit) and double (64-bit) precision floating-point arithmetic functions, the processor has implemented several special purpose instructions, including register-state save and restore and a polynomial evaluation primitive.

Typical execution times for floating-point operations range from 2.8 microseconds for single-precision addition to 15.5 microseconds for double-precision division, the spokesman stated.

The PEB costs $4,000 and is scheduled to be shipped this April from the firm at 19 Alpha Road, Chelmsford, Mass. 01824.

Benchmarks Changing

(Continued from Page 61)

stand a chance against a compiler, and optimizing compilers — such as that of IBM's Fortran-Level H — clearly outperformed their less intelligent brethren.

To counter the optimization challenge, a new benchmark was prepared that forced any compiler, no matter how smart, to execute every logic path and perform every function.

Before Whetstone, the only measure that had achieved attention was the millions of instructions per second (Mips) rating. However, Mips is not a meaningful way to compare machines with different architectures.

IBM and Mips

IBM has championed, and still does, the use of Mips for comparisons within its 360/370 family — which is all right since all of the machines have the same instruction repertoire. But machines of different design have instructions of different power and complexity.

By relating its results to the historical Algol interpreter, the Whetstone avoids the problems of Mips. No matter how a computer executes the program, the result is always expressed in terms of the same standard.

Most benchmarks are measured in terms of the time they take to execute, which means, like golf scores, the smaller the better. This situation is ideal from a marketing perspective.

In fact, in the early '70s Digital Equipment Corp. and Data General Corp. waged a media war using the Whetstone numbers of their machines as weapons. To some extent that battle continues today, but with more competitors adding ammunition to the fray.

The original Whetstone is basically a composite of 100 scientific programs that were in use at the National Physical Laboratory.

The selection process that established the Whetstone standard has been verified countless times on numerous computers. However, with today's systems, the old measurement guard can run into some problems. For example, when Whetstone benchmarks are run on a system with a cache memory, the relatively small program fits snugly inside the cache and only measures its ability to number crunch out of the cache.

Writable control store, a feature that allows the user to provide microcoded versions of critical routines and can result in a 60% speed improvement, can boost the ratings numbers by as much as 20%.

Surprisingly, the sophistication of today's "intelligent" peripherals have strengthened the value of the Whetstone by freeing the processor to do precisely what the benchmark measures — processing — rather than I/O management.

Finally, as discussed earlier, software optimizers have doubled the ratings of some computers. And programmers' use of subprograms and structured programming methods have also decreased the accuracy of the esteemed Whetstone.

Saunders is a senior manager of advanced planning with Perkin-Elmer Corp., Oceanport, N.J.

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Digital Plotter Introduced For RS-232C-Port Systems

NEWTON, Mass. — Bascom-Turner Instruments has introduced an intelligent digital plotter that is said to provide graphics output for any computer system with an RS-232C port.

The Model 1100 plotter is microprocessor-based and reportedly includes such features as X-Y and strip chart plotting modes, an Ascii character generator with size and rotation control and an internal vector generator.

The plotter uses X and Y stepper motors and has a resolution of .005 in., repeatability of .002 in. and a plotting speed of 2.5 in./sec, according to the vendor. It also uses Z-fold paper and disposable fiber-tip pens.

Bascom-Turner Instruments is located at 111 Chapel St., Newton, Mass. 02158.

'Micrapoint' File, Retrieval System Enhanced

ST. PAUL, Minn. — 3M Co.'s Micrographics Products Division has enhanced its Micrapoint computer-assisted micrographics file and retrieval system, reportedly making it more user-friendly and offering greater storage capacities.

Like the earlier Micrapoint I, the Model II electronically indexes document images on microfilm or other microforms. Retrieval is accomplished by using one or more descriptors previously stored on diskettes or disks and cross-referenced to the image location, a spokesman said. Searches may be made for all images that contain a single descriptor or satisfy a pattern of several descriptors.

However, the latest system is said to offer users a longer record length for entering these descriptors, the ability to accommodate a variety of microforms and indexing techniques and prompting messages that guide the operator in using the system.

The Model II also features file and function passwords that permit a greater degree of supervisory control, a built-in sort function and the optional ability to use two fast-search fields, the spokesman noted.

The Model II's record length can be up to 40 char. and may be divided into as many as 10 fields. Indexing can employ block-batch-item filing, using various-size "film-blips" or image marks.

The 2M-byte diskette system is capable of supporting a total of three terminals. Later this year, the system will also be able to support up to 32M bytes of sealed Winchester disk storage, the spokesman explained.

The basic system costs $31,000 and will officially debut at the National Micrographics Association convention this May in St. Louis. Additional information is available from the firm at P.O. Box 33600, St. Paul, Minn. 55133.

Printer System Displays Label, Tag Data on CRT

DAYTON, Ohio — An on-line/off-line price tag and label printer that reportedly uses a CRT screen to display an image of the tag to be printed and guides an operator with data entry has been introduced by Monarch Marketing Systems, Inc.

The Model 2040 Controlled Printing System was designed to help operators with entering tag or label information through prompts and images shown on the CRT. The unit displays the label image and shows constant characters, spacing and field length requirements.

The system's prompting capabilities make it suited for use by the handicapped, the vendor said.

A master system is priced at $11,200 with auxiliary terminals priced at $9,700. Monarch Marketing Systems can be reached through P.O. Box 608, Dayton, Ohio 45401.

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	Expected 1980	1979	1978	1977
Manufacturers	$ 9,975,110	$ 9,528,060	$ 8,811,330	$ 8,223,160
Service	2,147,900	2,039,530	1,898,180	1,740,740
Wholesale	678,520	611,280	550,700	503,180
Retailers	412,100	404,410	456,970	470,800
Total	$ 13,213,630	$ 12,583,280	$ 11,717,180	$ 10,937,880

to a 132 column statistical tabulation on the same standard narrow 8½" paper like this:

	Expected 1980	1979	1978	1977	1976	1975
Manufacturers	$ 9,975,110	$ 9,528,060	$ 8,811,330	$ 8,223,160	$ 7,650,450	$ 6,900,700
Service	2,147,900	2,039,530	1,898,180	1,740,740	1,600,530	1,702,130
Wholesale	678,520	611,280	550,700	503,180	487,570	533,450
Retailers	412,100	404,410	456,970	470,800	491,964	536,400
Total	$ 13,213,630	$ 12,583,280	$ 11,717,180	$ 10,937,880	$ 10,310,516	$ 9,832,840

This unique feature can be very useful when you want to line up multiple columns of figures side by side. Or do other extended financial or tabular comparisons without having to change to wider paper.

As you can see, either format prints in crisp, dark, highly readable upper and lower case characters. For one thing, the printhead is temperature compensated so print density is constant. And it should stay that way for a long time due to the reliable microprocessor design.

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Tool Combines Wang I/O Boards Into Single Security Package

SHAWNEE MISSION, Kan. — Computer Concepts, Inc. has unveiled a device that combines several Wang Laboratories, Inc. I/O boards into a single plug-in package that offers a variety of security features. At the same time, the firm announced RTC Basic, described as an alternative to Wang Basic.

RTC 2200, which was designed to fit Wang minicomputers, reportedly provides two levels of software protection. On its first level, it retains an eight-digit license date in nonvolatile memory. It sets a flag when the current date exceeds this license date so application software can lock out users who fail to renew. The date can be changed, however, by use of a special "key" program unique to each system/house user.

On the second level, RTC 2200 can retain a serial number that is compared to that licensed to the software. The application software will not be allowed to operate if serial numbers do not match or if RTC 2200 has been removed.

Implementing this second level of software protection requires the use of RTC Basic, an operating system that is available free of charge to those purchasing RTC 2200.

The operating software reportedly includes several new statements including a date function. RTC Basic also can be used to decrypt protected programs through the use of a "key" command, the vendor said.

The RTC 2200 unit includes clock functions, calendar management and two levels of software protection. In addition, two serial ports and a parallel printer port are available on an enhanced version known as RTC 2200P, the vendor said.

Additional Features

The clock section of RTC 2200 was designed to report the time of day in a 24-hour format, as well as provide a stopwatch, count-down timer and alarm clock. The calendar section retains system date and user date. The time and date information can be reported in either binary-coded decimal or Ascii.

The RTC 2200P provides the same time and calendar functions as RTC 2200, but also combines the functions of two Wang 2207s and one 22CO2 board. In addition, these ports are buffered and can operate independently at 16 transmission rates, ranging from 110 bit/sec to 19,200 bit/sec.

RTC 2200 is priced at $595 for a single unit. RTC 2200P costs $895. Multiple quantity discounts are available, the vendor said.

Computer Concepts is located at 8001 W. 63rd St., Shawnee Mission, Kansas 66202.

Altos Micros Allow Three Users to Share Micro-Based Data Base

SAN JOSE, Calif. — Altos Computer Systems, Inc. has introduced a series of multiuser microcomputers that feature micro-Winchester hard-disk storage and are said to allow up to three users to share a common data base.

The Series 5 presently consists of two systems, the Models 5-15D and 5-5D. Both systems are based on a Zilog, Inc. Z80A microprocessor and have 196K bytes of random-access memory, 48K bytes of which are reserved for utility and operating system programs.

The systems also have four serial I/O ports and one parallel port, a spokesman said.

The basic 5-15D system has dual 5¼-in. flexible disk drives that offer a combined storage of 2M bytes. The Model 5-5D features a 5M-byte, 5¼-in. micro-Winchester and a 1M-byte floppy disk backup drive.

The Series 5 is a multitasking system that can reportedly perform a variety of business or scientific applications simultaneously.

The systems permit one serial port to be configured as a high-speed 800K-bit multidrop network port, while another can be configured for asynchronous or bisynchronous communications, according to the spokesman.

The serial ports have independently selectable transmission rates, he noted.

Parity Checking

Other features of the Series 5 include direct-memory disk access and parity checking, which notifies the user of memory problems.

The systems are compatible with Digital Research, Inc.'s CP/M and MP/M as well as other operating systems and are housed in a desktop-size cabinet.

The 15-5D costs $3,990, while the Winchester-based 5-5D is priced at $6,990. The per station cost is about $2,000.

Altos is located at 2360 Bering Drive, San Jose, Calif. 95131.

Business-Oriented Micro Compatible With Apple II

PENNSAUKEN, N.J. — A business-oriented microcomputer that is said to be fully compatible with Apple Computer, Inc.'s Apple II hardware and software has been introduced by Franklin Computer Corp.

The Ace 100 emulates the Apple operating system and is aimed directly at the Apple II market. The system includes 64K bytes of random-access memory, an uppercase and lowercase keyboard, a character generator, a 12-key numeric pad and an alpha shift lock key. An optional 5¼-in. floppy disk drive is also available.

The computer's keyboard also includes a group of specially designated keys designed to work with Visicorp.'s Visicalc software, according to Franklin.

Programs written for the Apple II will reportedly run on the Ace 100, including those using high- and low-resolution black and white graphics. The machine is also plug-compatible with all Apple II peripherals without modification, Franklin said. The price of the Ace 100 is $1,595 and it is immediately available from Franklin Computer Corp., 7030 Colonial Highway, Pennsauken, N. J. 08109.

Products Enhance Memory Of HP 9845 B, C and T Minis

ANAHEIM, Calif. — Two products designed to enhance the performance of Hewlett-Packard Co. 9845 B, C, and T minicomputers have been introduced by Infotek Systems, Inc. — a 524K-byte memory board and a disk system.

The AM-45B 524K-byte memory board can be installed in tandem to increase memory size by more than 1M byte, the vendor said.

The FD9885 disk system features 2M bytes storage capacity.

Both products are software and hardware compatible with HP 9845 minicomputers. The FD9885 is also compatible with the HP 9825 and 9835 minicomputers.

The memory board sells for $3,500, the disk system for $3,700 from Infotek Systems, 1400 N. Baxter St., Anaheim, Calif. 92806.

HP 9845 Gets Firmware Storage

NEW YORK — Eventide Clockworks, Inc. has announced a firmware mass-storage feature for Hewlett-Packard Co. HP 9845 desktop processors.

The read-only memory (ROM) can be used with the firm's WMAZ-4 memory board, which can expand an HP 9845 system to 1.6M bytes. The additional memory can be used for disk emulators, tape cartridges or support for hard disks, the vendor said.

The ROM costs $400, a full WMAZ-4 512K-byte memory board costs $4,500, a half-populated version costs $3,250 the vendor said from 265 W. 54th St., New York, N.Y. 10019.

Printers Give System/34, System/38 WP Capabilities

GAITHERSBURG, Md. — Printer Systems Corp. has introduced three printer systems that allow the IBM Systems/34 and System/38 to be used for word processing.

The systems, which include either a Data Products Corp. daisywheel printer or one of two NEC Information Systems, Inc. Spinwriter printers, come with an IBM System/34- and System/38-compatible controller, printer stand and paper stacker, the vendor said. The daisywheel printer operates at 50 char./sec, while the NEC models operate at up to 33 char./sec or 55 char./sec.

The printer systems range from $4,725 to $5,500. Printer Systems provides on-site maintenance, the vendor said from Suite 104, 1 W. Deer Park Road, Gaithersburg, Md. 20760.

Text Details Small Firms' DP

CHERRY HILL, N.J. — The third edition of *How Small Businesses Use Computers* has recently been made available from Management Information Corp. (MIC).

The 96-page report describes how various companies select and manage computer systems. Interviews were conducted with business people from areas including government, manufacturing, medical, law, wholesaling and service bureaus.

It also describes computer acquisition procedures.

The text sells prepaid for $18 from MIC, 140 Barclay Center, Cherry Hill, N.J. 08034.

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	DESCRIPTION	PURCHASE PRICE	PER MONTH 12 MOS.	24 MOS.	36 MOS.
DEC	LA36 DECwriter II	$1,695	$165	$ 88	$ 48
	LA34 DECwriter IV	995	95	53	30
	LA34 DECwriter IV Forms Ctrl.	1,095	109	60	40
	LA120 DECwriter III KSR	2,295	229	122	83
	LA120 DECwriter III RO	2,095	209	112	75
	VT100 CRT DECscope	1,695	162	89	61
	VT101 CRT DECscope	1,195	115	67	43
	VT125 CRT Graphics	3,295	315	169	119
	VT131 CRT DECscope	1,745	167	89	63
	VT180 CRT DECscope	1,895	189	100	72
	VT180AC Personal Computer System	2,395	230	125	90
TELE	TT745 Portable Terminal	1,695	163	89	65
	TT765 Portable Memory Terminal	2,095	240	130	93
	TI Insight 10 Terminal	695	67	37	25
	TT765 Portable KSR, 120 CPS	2,095	230	129	90
	TT767 Portable KSR, 120 CPS	2,845	273	152	102
	TI810 RO Printer	1,695	162	89	61
	TI820 KSR Printer	2,195	211	117	80
ADDS	ADDS CRT Terminal	595	57	34	22
	ADDS CRT Terminal	645	62	38	24
	ADDS CRT Terminal	1,195	112	69	42
	ADDS CRT Terminal	1,895	180	105	72
	EXCEL 12 CRT Terminal	1,695	162	89	61
	EXCEL 42 Smart Buffered CRT	995	89	54	36
	COLOVISCAN 10 Color CRT	3,195	307	171	116
	925 CRT Terminal	895	82	48	31
	950 CRT Terminal	1,975	183	97	66
	Letter Quality, 7715 RO	2,895	278	154	104
	Letter Quality, 7725 KSR	3,295	316	175	119
GENERAL ELECTRIC	3800 KSR Printer 80 CPS	1,195	119	67	45
	3120 KSR Printer 120 CPS	2,195	211	117	80
ALETINE	Executive 60/20	1,345	127	75	50
	Executive 60/30	1,695	162	89	61
EPSON	MX-80 F/T Printer	745	71	42	27
	MX-100 Printer	995	95	49	32
	8K/48 4 Channel Slot Mux	1,895	147	89	60
	8K/48 8 Channel Slot Mux	2,495	197	110	74

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Mini Bits

Intel 8-Bit Micro Features 60% More Processing Power

SANTA CLARA, Calif. — Intel Corp. has developed an enhanced version of its 8-bit 8088 microprocessor that is said to be up to 60% more powerful than its predecessor.

Like other members in the 8088 family, the 8088-2 has an internal architecture similar to the firm's 16-bit 8086 microprocessor, allowing users to transport programs developed on one system to another system that uses a combination of the two micros. The 8088-2 supports Intel's iRMX 86 and iRMX 88 operating systems and others including Digital Research, Inc.'s CP/M and the USCD p-System, a spokeswoman said.

The microprocessor was designed for use with personal computers, word processors and intelligent CRT workstations.

Corvus Reduces Prices 15% On Its Winchester Disk

SAN JOSE, Calif. — Corvus Systems, Inc. has reduced prices up to 15% for its Winchester disk system for microcomputers.

Effective this month, the cost of the 6M-byte disk system has been lowered from $3,750 to $3,195. The 11M-byte disk has been reduced from $5,350 to $4,995 and the 20M-byte version is $5,995, down from $6,450.

More information on these price cuts can be obtained from Corvus Systems, Inc., 2029 O'Toole Ave., San Jose, Calif. 95131.

Device Allows IBM PC To Run Existing Programs

NEW YORK — An electronic device that is said to make the IBM Personal Computer (PC) compatible with thousands of existing software programs has been introduced by Xedex Corp.

The Baby Blue CPU Plus, the first product of the recently formed independent firm, is described as a combination circuit board and software, with a built-in memory of 64K bytes and a Z80B microprocessor. The unit allows the system to run CP/M80-based software programs. It also doubles the memory capacity of the IBM computer, a spokesman said. Baby Blue is functionally identical to an IBM memory board and plugs directly into an existing slot on the IBM Personal Computer.

The device costs $600. Shipments will begin April 1, according to the vendor at 645 Madison Ave., New York, N.Y. 10022.

Motorola 6800 Users Gain 10M-Byte Winchester Disk

SAN DIEGO — Computer System Associates, Inc. has announced a 10M-byte Winchester disk drive for users of Motorola Corp. 6800- or 6808-based Exorcisor systems.

The hard disk will operate under Motorola's Mdos operating system. The Computer System Associates microcode emulates 16 virtual, double-side, single-density 8-in. floppy disk drives, the vendor said. The unit can be installed by switching one chip in the Exorcisor disk controller and inserting a hard-disk interface into the Exorcisor backplane.

The 10M-byte Winchester drive costs $6,875, from the firm at 7562 Trade St., San Diego, Calif. 92121.

Chatsworth Interface Links OMR-500 Reader to Apple

CHATSWORTH, Calif. — Chatsworth Data Corp. has introduced an intelligent interface that allows users to connect its OMR-500 card reader to Apple Computer, Inc.'s Apple II microcomputer.

The interface permits the card reader to operate under either Digital Research, Inc.'s CP/M or standard Apple program control. Using the interface, the card reader can be used for programming, test scoring and surveys, using languages such as Basic, Fortran and Cobol, the vendor added.

The price of the reader is $1,095 from Chatsworth Data, 20710 Lassen St., Chatsworth, Calif. 91311.

Apple Processors Get 5¼-In. Disk Drive

ANN ARBOR, Mich. — A.M. Electronics, Inc. has announced a 5¼-in. disk drive for Apple Computer, Inc. processors.

The unit has been tested with Apple's disk operating system Apple software, the vendor claimed.

A 40-track drive costs $395; an 80-track version costs $495, the vendor said from 3446 Washtenaw Ave., Ann Arbor, Mich. 48104.

S-100/IEEE Micro Gets 5M-Byte Fixed-Disk Unit

RICHMOND, Calif. — Morrow Designs, Inc. has announced Discus M5, a 5M- byte fixed disk system for S-100/Institute of Electrical and Electronics Engineers 696 bus microcomputers running the CP/M operating system.

The unit features a Storage Technology Corp. ST506 mini-Winchester 5¼-in. disk drive with a transfer rate of 60K byte/sec. The subsystem features 5M bytes of formatted storage, 6.38M bytes unformatted. The subsystem can be expanded to 20M bytes by daisy chaining four disk drives, the vendor said.

A 5M-byte system including power supply, necessary cables, a controller and a CPM/2.2 operating system costs $2,495, the vendor said from 5221 Central Ave., Richmond, Calif. 94804.

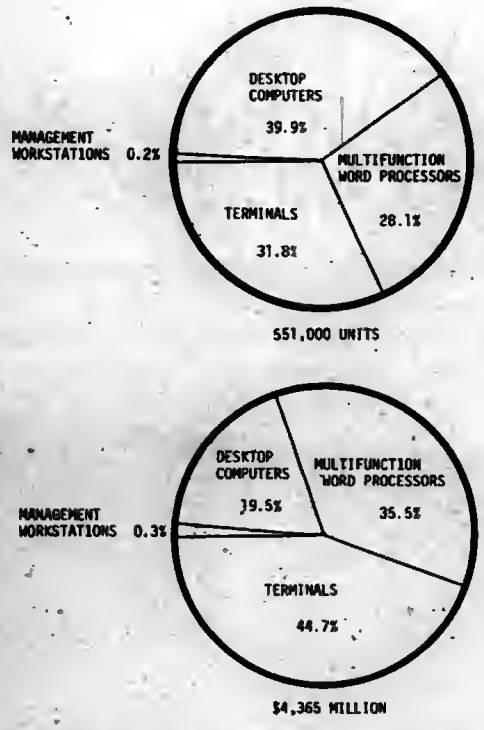
Add-In Circuit Card Offered for Apple CPUs

FREMONT, Calif. — Prometheus Products, Inc. has announced Versacard, an add-in circuit card for Apple Computer, Inc. Apple processors.

Versacard includes a serial I/O interface, a clock/calendar and a control module, the vendor said.

The unit supports the RS-232C standard, and a terminal mode permits output to both the printer and CRT terminal at the same time, according to the vendor.

The card costs $249, the vendor said from 45277 Fremont Blvd., Fremont, Calif. 94538.



The charts above from Applied Resources Development show the 1981 installed base of workstation devices.

Workstation Study Covers Four Product Categories

BOSTON — There were 550,000 installed devices valued at $4.3 billion performing workstation functions in office environments at the end of last year, according to a recent market study conducted by Advanced Resources Development, Inc. (ARD).

The study is entitled *Management Workstations; Markets and Strategies, 1981-1986.*

Of the four product categories that make up this user base, desktop computers accounted for 39.9% of the installed units. Terminals attached to host computers providing office automation support had 31.8%, while multifunction word processors comprised 28.1%.

Demonstration Models

Less than 1% were specialized management workstations. The study estimates that these approximately 1,000 workstations actually installed in offices today are mostly for demonstration and evaluation.

According to ARD, workstation technology will be based on the microcomputers used on desktops today. Desktop computers provide the most cost-effective means of equipping office workers with the dedicated processing power essential to the workstation concept. With the addition of communications, general-purpose desktop computers will supply the rapidly expanding market for low-cost management workstations in the coming five years, the study claims.

As the workstation market matures, specialized workstation products developed for targeted occupational and vertical markets will gain an increasing share of the installed base.

Recent introductions of specialized workstation products include the Powerstation by Excalibur Technologies for the executive market and the Xerox Corp. Star workstation targeted at professionals with heavy document-generation applications. ARD foresees a significant growing market for workstations designed for managers in specific industries such as finance or distribution, which will promote further differentiation of workstation products.

Complex Workstations

Complex workstation systems will be developed both from the "bottom up" by interconnecting stand-alone devices into completely distributed systems and from the "top down" by attaching workstation devices to larger

(Continued on Page 72)

Portable Office System With Winchester Disk Added to HP 250 Series

PALO ALTO, Calif. — Hewlett-Packard Co. has expanded its HP 250 office systems line by introducing a portable computer that features a sealed Winchester disk drive and is said to cost about 20% less than the firm's previous entry-level system.

At the same time, HP released an updated version of its operating software, designated OS-4.02, and announced that all of its HP 250 systems using this operating system will be able to interface with the company's newly introduced Model 7470A two-pen plotter.

The HP 250/20 small office computer system has a 4.7M-byte Winchester disk and 1.2M bytes of flexible disk for personal I/O and backup, a spokesman said. The main storage can be expanded to 260M bytes using the firm's recently unveiled 28M- and 65M-byte sealed disks. Like other systems in the 250 line the Model 20 has from 32K bytes to nearly 400K bytes of memory. The system features the same CPU incorporated into the firm's larger HP 250/30, the spokesman added.

The system was designed to be installed by the user and is entirely packaged in a single cabinet that can be wheeled from place to place within an office. Designed to be a multiuser system, the 250/20 can be used in the branch operations of a large firm and offers such software features as data base management, text processing and distributed job entry communications. Other applications include financial accounting, order management and bill-of-materials processing, the spokesman explained.

The systems's OS-4.02 operating system includes the software interface for the Model 20's Winchester disk. Since the software also is said to support HP's pen plotter, the firm also released a new version of its decision-support graphics applications package that is geared to work with the HP 7470A plotting device.

The base price of the 250/20 is $18,250, which includes the processor, a system workstation, the Winchester disk drive and a flexible disk backup. Additional workstations each cost $2,500, the spokesman said.

Additional information on the 250 Series can be obtained from local HP sales representatives.

Philips Units Gain Variety Of Updates

NEW YORK — Philips Information Systems, Inc. has unveiled software and peripheral enhancements for its 2001, 2001E and 2002 word processors and its stand-alone word processor.

The enhancements include four software packages, IBM 3276 Binary Synchronous Communications (BSC), a time-management system, an applications package for architects and engineers, a new printer and an educational package.

The software packages include CP/M support, which allows 2001 users to run certain applications under the CP/M operating system; a spelling error detection package for the 2001E; Miconet II intersystem communications; and support for dual-font/two-color printing.

The Model 3003 stand-alone word processor is said to feature a 5¼-in. diskette, keyboard/display CRT terminal with 15-in. screen and text-editing software with graphics. It costs $8,900.

The CP/M package is priced at $450, the spelling package at $700 including standard WP features, Miconet II is priced at $300 and the dual-font/two-color printing software costs $400. All of the packages are available within 60 to 90 days.

Philips said that the IBM 3276

(Continued on Page 72)

Saturn Offers New Release Of WP Package

HOPKINS, Minn. — Version 4.1 of Saturn Systems, Inc.'s WP Saturn is a word- and list-processing software package for Digital Equipment Corp. PDP-11 computers operating under RT-11, RT-11/TSX, RSX, RSTS-E and IAS. The software also runs under VMS for VAX-11s.

Version 4.1 is said to feature enhanced list-processing capabilities that allow users to design screen formats and prompts for list-processing applications. After list data is entered according to the user-defined prompts, it may be sorted using multiple sort, selection and exclusion parameters.

The screen template may be changed and data converted to a new format without retyping. The maximum record size has doubled to 998 char./period; the maximum number of fields is 99 and a data file may contain up to 32,000 records, the vendor said.

The software costs between $2,500 and $5,000, depending on the operating system. Saturn may be reached at Box 764, Hopkins, Minn. 55343.

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U.S. Firm to Carry Orion Software Including Utility, Mail Packages

LEEDS, England — Orion Software Ltd. has announced the availability of its software product line in the U.S. through Systems Concepts, Inc. and has also unveiled a utility and an electronic mail package.

The Interface Generation Utility (IGU-2) and Network/Orion Electronic Mail are designed to enable users to create local and remote interfaces with non-IBM word processors and other IBM office automation products.

IGU-2 runs on any IBM System/34 model with one or more communications adapters and at least 64K bytes of main storage, the vendor said, adding that it runs with System Support Program's Release 7 or later releases and requires Binary Synchronous Communications support for immediate access files.

The Network/Orion Electronic Mail software offers network capabilities and document control functions. For locally attached display stations, no additional communications facilities are required for installation, according to the vendor. For single System/34 networks with remotely attached display stations, the minimum requirement for its installation is a communications adapter plus modems. Network/Orion, in single quantities, sells for $8,000 and includes IGU-2. IGU-2 sells separately for $3,000. The vendor is located at P.O. Box 363, Harvard, Mass. 01451.

Workstation Market Detailed

(Continued from Page 69)

computer systems equipped with office automation software. Specialized workstation devices will serve as user interfaces in both the completely distributed and partially centralized systems.

Among the major vendors who are developing workstation systems using the centralized approach are Honeywell, Inc.; Burroughs Corp.; Hewlett-Packard Co.; Prime Computer, Inc.; Digital Equipment Corp.; Data General Corp.; and IBM, the report noted.

These companies are concerned with leveraging their installed base of minicomputers and mainframes to gain rapid entry into office automation with computer terminal systems. However, these vendors are also introducing workstation devices based on desktop computers, which will be compatible with their centralized systems.

A more distributed approach to workstation systems is being pursued by microcomputer manufacturers, other minicomputer manufacturers and office systems vendors. Systems linking desktop computers and workstations are being offered by Xerox and Datapoint Corp. through their respective Ethernet and Attached Resource Computer (ARC) networks. An indication of the importance of desktop computers used as workstations is the agreement between Tandy Corp. and Datapoint to attach Radio Shack TRS 80s on the ARC network.

Independent vendors such as Convergent Technologies, Inc. and Excalibur Technologies are responding to the multiple role performed by workstations by offering products compatible with numerous communications protocols as well as terminal emulation.

The management workstation market is expected to grow at a healthy 40% per year through 1986. ARD projects more than 4.5 million workstations valued at $25 billion will be shipped during the five-year period from 1982-1986.

The market study is available for $1,695 from Advanced Resources Development, 28A Park St. Station, Medfield, Mass. 02052.

Philips Units Enhanced

(Continued from Page 69)

communications emulation for its Model 2001E emulates the IBM 3276 Model II with the 3278 printer and uses BSC. The 2001E can be used as a 3270 terminal to IBM computers running under systems such as CICS, IMS and TSO. The 3276 package is priced at $2,000 including WP and is available 60 days after receipt of order.

The time-management system — called Executive Time Management — is a hardware and software system that reportedly includes a workstation for use with or without a keyboard and software for control of tasks such as correspondence and organization charts. The typical system, with a 2002 WP, costs $19,150, with 60-day deliveries.

The architect's package, called Specpak, is an applications package designed for use with Philips 2000 systems and is priced at $350, also with 60-day deliveries.

Also introduced was the Philips 40 daisy-wheel printer. According to the company, the printer prints at 40 char./sec, uses Qume-compatible print wheels and Diablo-compatible cartridges. It sells for $2,800 and is available in 60 days, according to the vendor.

The company's educational package, aimed at corporations and schools, is called the Educational Support Package. It is priced at $2,200 and is available in 30 days.

Philips Information Systems is located at 4040 McEwen, Dallas, Texas 75234.

Despite Current Recession

Venture Capitalist Bullish on DP Market

By Marcia Blumenthal
CW Staff

SAN FRANCISCO — Although new venture capital investment probably peaked at $1.3 billion last year, the outlook for venture dollars being funneled into the computer industry remains bullish, according to one venture capitalist.

Indicators of the level of venture capital investment are reflected in the performance of the stock market and the number of new public equity offerings, explained Roy Rogers, managing partner of Hambrecht & Quist, a San Francisco-based investment banking and venture capital firm. While the stock market has been doing poorly of late, last year 450 new public offerings were made, with more than 50% being high-technology issues, Rogers told a group attending the Computerweek conference here recently.

Venture capital investment tends to be cyclical, he noted. The last peak was in 1969, when $70 million — worth $600 million in today's dollars — was invested and 1,300 public offerings were made. The nadir occurred in 1975 when only $10 million was invested and 25 companies went public.

Despite the current recessionary economy, Rogers said his firm will continue to invest heavily in computer-related businesses. Over the past 12 years, Hambrecht & Quist has invested in 150 companies, with 50% to 70% of its portfolio in computer-related firms.

However, Rogers, along with other venture capitalists, have reported that high-technology investments are becoming more competitive, yielding lower returns.

Significant Opportunities

Rogers said his firm sees significant opportunities in several computer markets:

- *Processors.* The firm is looking for the next Apple Computer, Inc. or Tandem Computer Corp. "There are a raft of companies out there with 16-bit, 32-bit and 64-bit processor technology," he said.
- *Very large-scale integrated chips.* Japanese competition aside, Rogers sees good opportunities in large-scale integrated chips and customized components.
- *Peripheral products.* These products represent another good opportunity. However, venture firms have made 40 investments in Winchester disk companies, and only a few of these will survive, Rogers predicted.

CW Photo by M. Blumenthal

Roy Rogers

Although software companies have received much attention from venture firms of late, Hambrecht & Quist — while interested — approaches this market gingerly. "The industry is plagued by poor management," Rogers maintained. A good software product can be acquired and enhanced, but good management and marketing savvy are the keys to success in the software industry, he explained.

Likewise, the firm is interested in data communications companies, but is not rushing into making investments in networking companies. Because communications is such a fragmented industry, "a lot has to be sorted out in networking during the next five years," he said.

Recent tax laws have made venture investment more attractive. One of these laws pertains to research and development partnerships. This arrangement permits investors a means of taking pretax dollars and funneling them into venture investments, Rogers said.

Nearly a third of venture funds raised during the past few years have come from individuals and families (23% of the total 1981 investment), pension funds (20%) and corporations (17%).

Upstart CTI Challenging Giants in the Mini Industry

By Robert Batt
CW West Coast Bureau

SANTA CLARA, Calif. — Within two years of its start up, Convergent Technologies, Inc. is counting among its clients some of the industry's biggest names and is rumored to have garnered orders worth more than $450 million over the next five years.

CTI is pitching straight into a market formerly the exclusive preserve of such established vendors as Digital Equipment Corp.; Data General Corp.; Four Phase Systems, Inc.; and Datapoint Corp. Formed in August 1979 by ex-employees of Intel Corp. and Xerox's Advanced Systems Division, CTI has captured lucrative orders from firms such as Burroughs Corp., NCR Corp., Savin Corp. and Thomson CSF of France.

CTI is challenging the minicomputer market with an approach that distributes computing power among many workstations while connecting all units through an electronic network system that makes them into a single machine. The objective is to combine existing technologies in such a way that the system grows with the user's needs from a single workstation to a minicomputer network.

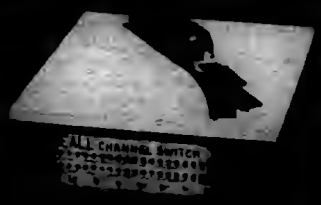
CTI is presently offering two families of workstations — IWS and AWS — either of which can be configured as stand-alone units or interconnected into a local network via a high-speed link. Each IWS workstation consists of a 16-bit 8086 processor, random-access memory and support for up to 1M byte of memory. It ranges in price between $6,500 and $20,000 for a stand-alone unit.

The AWS stand-alone price ranges between $4,000 and $11,000.

"We decided to build an operating sys-

(Continued on Page 76)

A Way to Keep Computers on the Right Track



John Beall & Company, Inc.

IPL Manager Points to Magnuson

PCM Vendors Told 'Stick to What You Do Well'

By Robert Batt
CW West Coast Bureau

SAN FRANCISCO — The financial problems recently encountered by Magnuson Computer Corp. are the result of bad management decisions, Charles Cornell, manager of field customer support at IPL Systems, Inc., said here recently.

Speaking on the future of plug-compatible mainframes (PCM) at the Computerweek conference, Cornell said the size of the difficulties faced by Magnuson and previously by Itel Corp. proved that it was poor management rather than the industry itself that was to blame.

"As a PCM vendor you need to stick to what you do well. The trouble with Magnuson is that they tried to expand into areas where they had no business being," Cornell maintained.

Cornell argued that being a PCM vendor means being able to offer a choice within a de facto standard as measured by the success of IBM. Users, he said, are increasingly accepting plug-compatible manufacturers as an alternative to IBM as an awareness of the reliability and service capability of PCM vendors increases.

"IBM is constrained in its ability to design new products by its large customer base. It cannot make too many drastic changes because its users will not go with them." Consequently, according to Cornell, as long as there is IBM there will be a PCM industry. IBM simply could not satisfy all the market's requirements, and users realized they could not put their business at the mercy of one supplier.

"There is a tremendous opportunity for the plug-compatible business, but you have to know what you are doing and adopt a strategy that is a lifetime plan rather than a one off thing," he noted.

Cornell said the key to success is creating an image that is not just "follow your leader." This point was taken up by another speaker at the session, Michael Backler, director of product planning at Nixdorf Computer Corp.

Backler said that while it is crucial that a PCM vendor demonstrate it has the capability to be compatible with new IBM announcements, the user is also looking for something else. "IBM is not servicing its customers the way it used to, and the trick for PCMs is to keep users happy by supplying them with systems and functions, particularly in the area of software that IBM doesn't supply," Backler said.

Users, he argued, are not as interested in growing at the pace of IBM as they are in growing in line with their own requirements. The most important thing to the user, he said, is not to get locked into any one vendor and not to have to choose products that threaten the investments they have already made.

PCMs also have to make substantial investments, Backler pointed out. To secure adequate profit margins they need to have a large-scale manufacturing capability, be able to distribute their products worldwide and be able to fund large-scale on-going research.

Backler said that in the past, PCM vendors have been hampered by not generating the research and development revenues that would allow them to come up with IBM-compatible products ahead of an IBM announcement. Instead, they have relied on venture capital for their financing requirements.

"The ability to mix and match with IBM program products is very useful, particularly in the software area. That is what most users of DOS are interested in, for example," Backler claimed. If a PCM vendor wants to compete in the market, it must be prepared to make a high investment in software.

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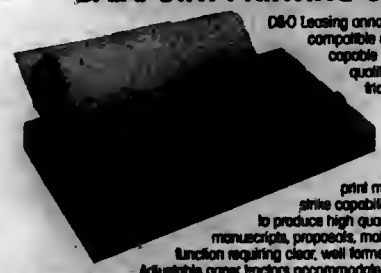

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Exec: 32-Bit Minis Leading Growth in Mini Market

By Robert Batt
CW West Coast Bureau

SAN FRANCISCO — The market for 32-bit minicomputers is the fastest growing segment of the minicomputer market, with vendors trying to bring the machines down to a level where they can compete with the medium and high end of the 16-bit range, Edwin Churchill, western regional manager for Perkin-Elmer Corp., told the Computerweek conference here last week.

With a 37% market share, Digital Equipment Corp. is the leading manufacturer in the field, Churchill said, followed by Prime Computer, Inc. with 20% and PE with 18%.

The supermini market was defined at the conference as 16-bit and 32-bit products capable of supporting between 4M- and 8M bytes of main memory and costing about $200,000.

The development of the superminis has resulted in users becoming more and more loyal to a single vendor source, Churchill said. Users are looking for, among other things, product-line capability, development tools, software support, hardware reliability, cost competitiveness and a solid manufacturer reputation.

PE's strategy, he told the conference, is to link up with service companies and systems houses in joint ventures to provide turnkey systems to users. "You have to pick your spots carefully; you have to target the market," he said.

Churchill argued that with an increase in the availability of venture capital funds as a result of the Reagan administration's tax policies, there are now plenty of opportunities to exploit this market.

"There are millions of dollars lying out there for people with ideas, and we can expect a whole set of product breakthroughs as a result of venture capital activity," he said.

Among the sectors he singled out for attention was the fail/safe processing market, pioneered by Tandem Computer Corp. This concept, which offers full redundancy in operating software, has now ripened for 32-bit machines, and a number of new companies have started up in this area, he said.

He also said the planned growth in space shuttle missions, with more than 500 flights planned as part of the *Columbia* program, meant there would be an enormous demand from the National Aeronautics and Space Administration, the Department of Defense and the commercial world for superminis capable of carrying out satellite data functions.

Churchill said that while 32-bit machines are the current "hot buttons" of the industry, the slower than expected growth in distributed data processing means there were still plenty of opportunities in the market for 16-bit devices.

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Bell Set to Cut '82 Expenditures by $500 Million

NEW YORK — The Bell system will be able to reduce its 1982 expected external financing needs by $500 million and possibly more because construction expenditures can be reduced without affecting the quality of service, AT&T Chairman Charles L. Brown said here recently.

Brown told the New York Society of Security Analysts that Bell economists expect the economy to begin turning around in the second quarter. "Nonetheless, the softness in the economy to date has caused us to rescale our construction program for 1982," he said. "We feel confident that we can do a top-quality service job with $18.3 billion rather than the $18.9 billion construction expenditure estimate that we announced earlier.

"And unless there is an earlier or more robust turnaround in the economy than we anticipate, we may be able to bring that figure to $18.1 billion — the same as last year," Brown said.

Brown emphasized that the reduction would be in the expenditures to handle customer movement and growth and would not affect Bell's plans for modernization.

The Bell system's estimated 1982 short- and long-term debt and equity needs now will be between $4 billion and $4.5 billion. The company has said it expects to raise approximately $2.5 billion of this amount from ongoing sources of equity such as its dividend reinvestment plan and Bell employee savings plans.

On other matters, Brown said that in assenting to the proposed Consent Decree with the Department of Justice, "we take not even a half step back" from traditional commitments. Among those commitments, he said, are "to provide service that is widely available and readily affordable; to provide a nationwide network — a network that has been referred to as a national resource — that is constantly being improved in terms of its capabilities, its quality, its costs; and to provide communications for national security in times of both peace and war."

Brown also reiterated the company's commitment to divest the operating telephone companies in sound financial shape. "In addition, we are committed to providing them the information and human resources needed to do the job. And we are required, under the decree, to assure that they get the kind of technical and manufacturing support from Bell Labs and Western Electric they need, on a priority basis — for a period of five years," he said.

AT&T Subsidiary to Raise $400 Million in Eurobond Market

NEW YORK — AT&T has announced that its subsidiary, AT&T Overseas Finance N.V., plans to raise $400 million in seven-year debt in the Eurobond market. The proceeds will be loaned by the subsidiary to AT&T, which will use them for advances to subsidiary and associated companies for equity investment and for general corporate puposes.

AT&T will guarantee payment of principal, premium and, if any, interest. The proposed sale will be managed by an international underwriting group led by Credit Suisse First Boston Ltd.

Application will be made to list the securities on the stock exchange in London, where AT&T listed its common shares in January, according to a company spokesman.

The securities have not and will not be registered under the U.S. Securities Act of 1933 and may not be offered or sold in the U.S., its territories or its possessions or to U.S. nationals or residents.

While the securities will not be available in the U.S., AT&T said it had been advised that the subsidiary's debt issue will be rated highest by both Moody's and Standard and Poor's rating agencies.

Court Acquits CA Officials

LOS ANGELES — A federal district court jury here recently acquitted Computer Automation, Inc. and three of its officials of charges that they failed to properly disclose adverse financial information to shareholders in August 1978.

The suit was brought by Alvin J. Ivers, a Philadelphia attorney and former holder of CA stock, on behalf of himself and others who purchased CA stock during a two-month period in 1978. Ivers charged that the company neglected to disclose timely information relating to a downward dip in its profit projections in the first quarter of fiscal 1979.

In rendering the decision, the jury affirmed the defendants' contention that they had acted promptly and in good faith by announcing as soon as they were "reasonably certain" that the company would sustain a $1.5 million pretax loss for that period.

Upstart CTI Challenges Mini Giants

(Continued from Page 73)

tem with networking capabilities," said Alan Michel, company president. "It was organized and designed from the ground up to provide for clustering and local-area networking and in this sense is intended to be a truly distributed operating system."

Reflecting its intention to offer an alternative to minicomputers via this distributed intelligence architecture, the company also provides a multitasking operating system, called Ctos, which supports Cobol, Fortran, Basic and Pascal as well as assembly languages.

"We have built a product which is multifunctional and has enormous end-user appeal," claimed Ben Wegbreit, vice-president for software engineering. Indeed, some industry analysts have pointed out, for example, that CTI's text editor is really a full-blown word processing system that needs only minor changes to rival some of the best on the market.

In addition, the company offers IBM 3270 communications emulation, a data base management package, word processing and financial accounting packages.

It was this kind of capability that led to some of the industry's giants signing contracts with CTI for the purchase of its current software and hardware, as well as several products still under development.

An Important Step

For NCR, in particular, the deal with CTI was an important step in its efforts to enter the office automation market, especially word processing, which is expected to become a $6 billion market by the mid-1980s.

Future product areas now being developed by CTI include local-area networks, communications emulators and data management systems. The company expects to come up with products that can operate under IBM's Systems Network Architecture. In addition, "we have an explicit plan to come up with quicker machines by using faster chips from Intel," explained Wegbreit.

CTI has the firm backing of the financial community. Its first round of financing netted nearly $3 million from private investors, and a second round in 1980 brought in $6 million from numerous venture capital firms.

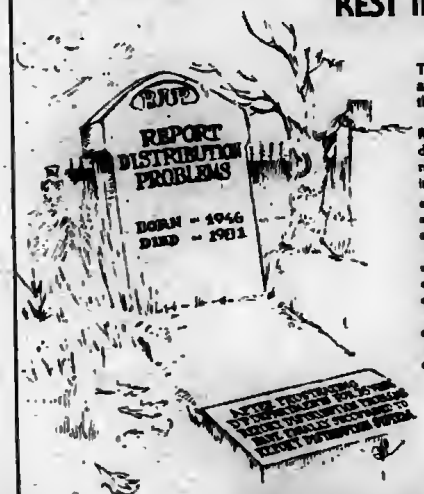
CTI's objective is to post revenues of $30 million by the end of this year — an ambitious target for a two-year-old venture.

Currently, the company is shipping around 400 systems a month. This is expected to accelerate to 100 per day by the end of the year.

All this activity is taking place in a company of 200 employees in which only six are sales representatives. "We must have one of the most technically oriented staffs in the industry," Wegbreit noted.

The company has chosen to market its products mostly through OEMs, despite their strong end-user appeal. Overseas, TRW, Inc. acts as a distributor for CTI.

REST IN PEACE



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House Told Cbema Favors Prompt Rewrite Act

Special to CW

WASHINGTON, D.C. — The chairman of the Computer and Business Equipment Manufacturers Association (Cbema) recentiy told a House of Representatives subcommittee on telecommunications that the majority of the companies represented by the organization supports congressional efforts to revise without delay the Communications Act of 1934.

H. Glen Haney, who is also vice-president of strategic planning and development for Sperry Univac, stated that "Cbema firmly believes that the ultimate success of the FCC [Federal Communications Commission] Computer II decision and, if approved, the proposed [AT&T/Justice Department] consent decree modification, rests squarely on the adequacy of new legislation.

"Cbema," Haney stressed, "does not agree with those who would recommend postponing legislation until the proposed consent decree modification has been finalized."

Haney's comments on Cbema's behalf were made to the House Subcommittee on Telecommunications, Consumer Protection and Finance considering H.R. 5158, the House version of telecommunications deregulation legislation. The Senate version, S. 898, already has passed the full Senate.

In e statement submitted to the House subcommittee on behalf of Cbema, Haney noted that the association agrees with "many other parties who previously testified before this subcommittee that telecommunications legislation should be enacted now, and Congress should not, as some would suggest, wait until the proposed consent decree settlement process has been concluded before moving forward."

Points Recognized

Cbema, Haney said, will continue to press for and support revisions to the 1934 Communications Act that recognize 12 points. According to those 12 points, the legislation should:

- Foster a national policy of maximum reliance on competition, rather than regulation, for telecommunications service and equipment.
- Make certain that regulation is limited to ensuring the provision of basic transmission services that are not subject to effective competition and provide for the deregulation of those regulated transmission offerings that are sufficiently competitive.
- Prohibit federal and state regulation of customer premises equipment, information processing and information services and enhanced services. H.R. 5158 would eppear to support these goals, except for certain sections containing language that could be construed as extending the purview of federal or state regulatory jurisdiction beyond where it is today.
- Limit FCC jurisdiction over customer premises equipment to only that necessary to enforce interconnection standards required to prevent technical harm to carrier networks.
- Ensure that basic transmission services, including private lines and local exchange facilities, are availeble to all at the same reasonable and nondiscriminatory rates, terms and conditions.
- Impose adequate accounting and other safeguards to ensure that regulated exchange or interexchange carriers offering enhanced services or customer premises equipment are not subsidized by their regulated activities.

The Cbema statement also said that:

- To allow for fair competition and to prevent cross-subsidization, there must be full and adequate separation requirements between the dominant carrier and its regulated offerings and the subsidiary or subsidiaries and their competitive offerings. A prohibition on ownership of transmission facilities by the subsidiary is necessary to provide important incentives for the dominant (regulated) carrier to continually improve and update its basic network.
- Separation of the subsidiary should be sufficient to control the flow of technical and commercial information between the dominant carrier and the subsidiary, provide an audit trail and adequate accounting practices to prevent cross-subsidization and prevent other potential anticompetitive abuses between the parent and the subsidiary.
- Legislation should ensure a proper and fair system for asset valuation during transition to a regulated environment to prevent anticompetitive advantages from accruing to the separate subsidiary, while easing the impact that the loss of these assets from the rate base will have on the ratepayer.

Mergers & Acquisitions

Computerecords, Inc. has sold its data center operations to **Computer Resources, Inc.**

Stockholders of both **Gould, Inc.** and **American Microsystems, Inc.** (AMI) recently voted to approve the proposed acquisition of AMI by Gould.

The **Arista Manufacturing Systems Division** of Xerox Corp. has recently been taken over by **Management Science America, Inc.** for $4 million in cash.

Management Assistance, Inc. will acquire **RCI Corp.** of Albuquerque, N.M., for an undisclosed amount.

Amplica, Inc. has recently been acquired by **Comsat General Corp.**, e subsidiary of Communications Satellite Corp.

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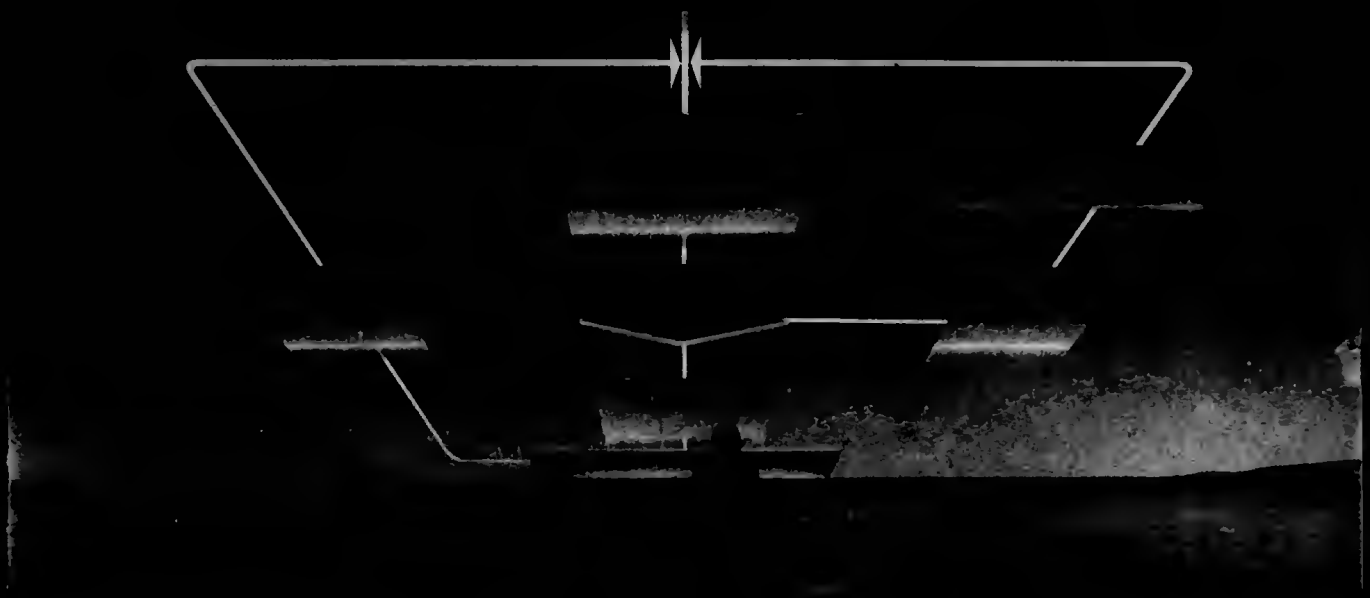

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Contracts & Pacts

DEC Announces Pact With Software Firms

LOS ANGELES — Digital Equipment Corp. has announced an agreement with five software companies to market their software with DEC's VAX-11 line of superminicomputers.

The firms are The Boston Systems Office in Waltham, Mass., Comsat General Integrated Systems in Austin, Texas, Matra Datavision in Burlington, Mass., NCA Corp. in Palo Alto, Calif., and Silvar-Lisco, Inc., also in Palo Alto.

The firms manufacture computer-aided design and manufacturing applications including microprocessor software development, DEC said.

Other Moves

BBN Computer Corp. and Olteco-Olivetti Telecommunicazioni S.p.A., have signed an agreement under which Olivetti will distribute BBN's packet-switching data network products outside the U.S. and Canada.

The U.S. Naval Surface Weapons Center at Dahlgren, Va., has awarded Sytek, Inc. a contract valued at over $1 million for its Localnet broadband networking systems.

Miniscribe has concluded contract negotiations with Xcomp, Inc. for the sale of about $10 million worth of Miniscribe products over the next two years to Xcomp.

Technical Analysis Corp. has agreed to distribute the Supercomp computer modeling package made by Access Technology, Inc. under the terms of a recent agreement.

M/A-Com Video Satellite, Inc. has been awarded a $5 million contract by National Microtech. The contract calls for electronics for the Apollo 2X home satellite receiving system.

Sorbus Service Division will provide nationwide service and support for BMS Data Handling, Inc.'s full line of optical data scanners.

Applied Digital Data Systems, Inc., (Adds) a subsidiary of NCR Corp., has received an order from Axxess Information Systems, Inc. for 1,000 Viewpoint/90 terminals to be delivered in 1982. Adds has also entered an agreement with International Micro Systems, Inc. to supply software for the Multivision computer system.

HDR Systems, Inc. has received a contract to place its Noah attached resource relational data base machine on the Datapoint Corp. ARC net used by the Washington Headquarters Services Directorate for Computer Support, the Pentagon. The system will support ad hoc query languages and embedded Cobol queries.

Lexicon Corp. announced that Telxon Corp. has agreed to purchase 2,000 Lexicon modems over a 15-month period.

Digital Research, Inc. has signed an agreement with Micro Focus, Inc. to share marketing and distribution rights for CIS Cobol and Level II Cobol.

Teac Corp. has signed a manufacturing and marketing rights agreement with Seagate Technology for the ST506 and ST412 5¼-in. micro-Winchester disk drives.

Cortex Corp. has announced a joint marketing venture with Digital Equipment Corp.'s Commercial Services Industries Group to develop computer systems for the banking and services industries.

The Air Force Computer Acquisition Center has awarded a $1.8 million contract to Digital Equipment Corp. for new equipment and support.

TLB Associates, Inc. has announced a $750,000 distribution agreement with Computech Group, Inc. covering TLB's Solomon series software.

Manufacturing & Consulting, Inc. and Control Data Corp. have announced a cooperative relationship in advanced computer-aided design and manufacturing technology.

Electronic Associates, Inc. has received a multimillion-dollar contract to support operations and upgrading of the U.S. Army Missile Command's Advanced Simulation Center at Redstone Arsenal, Ala.

Under the terms of a three-year agreement, Ragen Information Systems is now offering the Terminal Application Processing Systems developed by Informatics, Inc., with the Ragen HSD 1010 Information Management/Document Retrieval Systems.

Data General Corp. has chosen Digital Sales Associates, Inc. to act as manufacturer's representative in charge of selling the Micronova line of computers in New England.

Archives, Inc. has signed a distributor's license agreement with TCS Software, Inc. for the resale rights to the TCS Inventory Management systems.

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Burroughs Realigns to Bring Memorex Into Disk Projects

DETROIT — Burroughs Corp. has made a series of realignments of production and development responsibilities, implementing previously announced plans to combine the strengths of Burroughs and its subsidiary, Memorex Corp., a Burroughs spokesman said.

Burroughs' Westlake, Calif., complex will assume responsibility for the development of disk drive projects using Memorex technology and will begin manufacture of the Memorex 677 disk pack drive in the third quarter of this year.

As a stand-alone operation, Westlake will also house a development and production program for advanced disk media.

Also involved in the realignment is the transfer from Westlake to the Burroughs' Winnipeg, Manitoba, facility of the production of the Burroughs 207 fixed disk drive. The Winnipeg site also will become responsible for design and development of some sophisticated test equipment used in special-purpose applications.

Management responsibility for the Westlake and Winnipeg facilities is being assumed by Memorex. No significant production decreases are expected, a spokesman said.

Burroughs also announced that its complex at Cumberland, Scotland, will begin manufacturing products currently manufactured at Glenrothes, Scotland. The Glenrothes plant will be phased out by year's end.

The 400 employees of the Glenrothes plant will be offered an opportunity to participate in placement programs, a company spokesman said.

Supershorts

National Semiconductor Corp. anticipates a loss for its third quarter, ending March 7, due to continued poor business conditions and normal seasonability.

— — —

Compudial has officialy changed its name to Tristate Data Systems and has increased its range of services.

— — —

Shubrooks Computer Consultants, a British software firm, began U.S. operations in Kansas City, Mo., at the end of January.

— — —

Hewlett-Packard Co. and Computerland Corp. have reached an agreement in principle for Computerland stores to market HP's personal computers and peripheral products.

Management Science America, Inc. has established an international arm of its Peachtree Software, Inc. subsidiary in Berkshire, England.

— — —

Itel Corp. has filed preliminary unaudited financial information with the U.S. Bankruptcy Court for January because, the company said, its unrestricted cash balance decreased that month by about $9 million.

— — —

Visicorp has opened in Paris its first international office.

— — —

Xerox Corp. opened its first New York office products store for small businesses and professional offices at The Great Neck Mall, at Great Neck Road and Middle Neck Road.

Orders & Installations

California Microwave, Inc. has received a $1.1 million contract from Communications Satellite Corp. for ground communications equipment to be provided by the company's subsidiary, Satellite Transmission Systems, Inc.

ICL, Inc., the U.S. subsidiary of International Computers Ltd., has been selected by the New York State Department of Social Services to provide approximately 2,400 distributed

Sesa-Honeywell Communications, Inc. and Lincoln Telephone and Telegraph Co. of Lincoln, Neb., have signed contracts for the installation of private data networks. The contract, totaling some $5.5 million, represent Sesa's first major contracts since the company's beginning in 1980.

NCR Corp. has announed that Publix Super Markets, Inc. is purchasing 100 NCR Model 1773 automated teller machines (ATM) valued at $3 million for use in its shared ATM network. NCR Corp. has also received a $25 million order for point-of-sale retail terminals from Sears, Roebuck and Co.

Toa Domestic Airline Co. has inaugurated new message-switching and Notice to Air Men systems using a Sperry Univac 1100/62 computer supplied by Nippon Univac Kaisha Ltd., the Univac computer marketing venture in Japan.

Infosoft Systems, Inc. has reached an agreement with AED Microcomputer Products of Guildford, Australia, to become the exclusive agent for the entire line of Infosoft's microcomputer software products in Australia, New Guinea and New Zealand.

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Executive Corner

• Gary Holland has been appointed president and chief operating officer at Data Card Corp.

• William West has been named president of Computer Translation, Inc.

• Bob G. Robertson has been named president of Sorcim Corp.

• Robert J. Schreiner, founder and president of Synertek, a subsidiary of Honeywell, Inc., has resigned to pursue personal interests, but will continue as a consultant to the firm.

• Harold Shattuck has been elected president and chief executive officer of System Industries, Inc. He succeeds Edwin Zschau, who founded the company in 1968 and is leaving to run for a seat in the U.S House of Representatives.

• Alfred Stein has been named chief executive officer and chairman of the board of directors at VLSI Technology, Inc.

• M. Stanley Schlosser has been appointed president of LogE/Spatial Data Systems.

• Stephen P. Smith has been named president and chief operating officer of Relational Systems International Corp.

• Anthony Joyce has been appointed vice-president of sales and marketing of Summagraphics Corp.

• Ronald Peterson has been named vice-president of software development at NCR Comten, Inc.

• Daniel Reed Priedeman has been promoted to vice-president of subscriber services for the Management Systems Division of Informatics, Inc.

• Infoscribe, Inc. announced the appointment of Dale Edwards as vice-president of engineering.

• Harris Corp. has named three new division heads: Stanley Rosenburg has been named vice-president and general manager of the newly formed Bipolar Digital Products Division; Dr. Joseph Rowe has been named vice-president and general manager of the Program Division of the Semiconductor Group; and Thomas Brimer has been appointed vice-president and general manager of a new Controls and Composition Division.

• George Walker has joined Western Business Computers, Inc. as vice-president of marketing support.

• Robert Joseph has been named vice-president of marketing, sales and support at Computer Devices, Inc.

• Dennis McEvoy and Jan Jensen have been elected vice-president at Tandem Computers, Inc., and Larry Evans has joined the company as vice-president of operations.

• Cambrian Systems, Inc. has appointed Martin Albert vice-president of marketing.

• Karl Hirschauer has been named an assistant vice-president of technical sales in the Communications Division of Trans-Lux Corp.

• Genasys Corp. has announced the appointments of Ronald Husey and Myron Jonsberg Jr. to corporate vice-presidents.

• Irv Hamlin has been appointed to the new position of vice-president of marketing at Media Systems Technology, Inc.

• Southern Pacific Communications Co. has named George Vasilakos executive vice-president; Rex Hollis to vice-president of marketing of Spacenet products; and Craig Clymo, vice-president of planning and administration.

• Robert Austin has been appointed international vice-president and managing director for Britton-Lee, Inc.

• Raymond Mazurek has been elected vice-president of technical operations at T-Bar, Inc.

• Melvin S. Day has been named vice-president of information clearinghouses for Indian Head's Information Technology Group.

• Robert Lee has been appointed vice-president of personnel at Plantronics, Inc.

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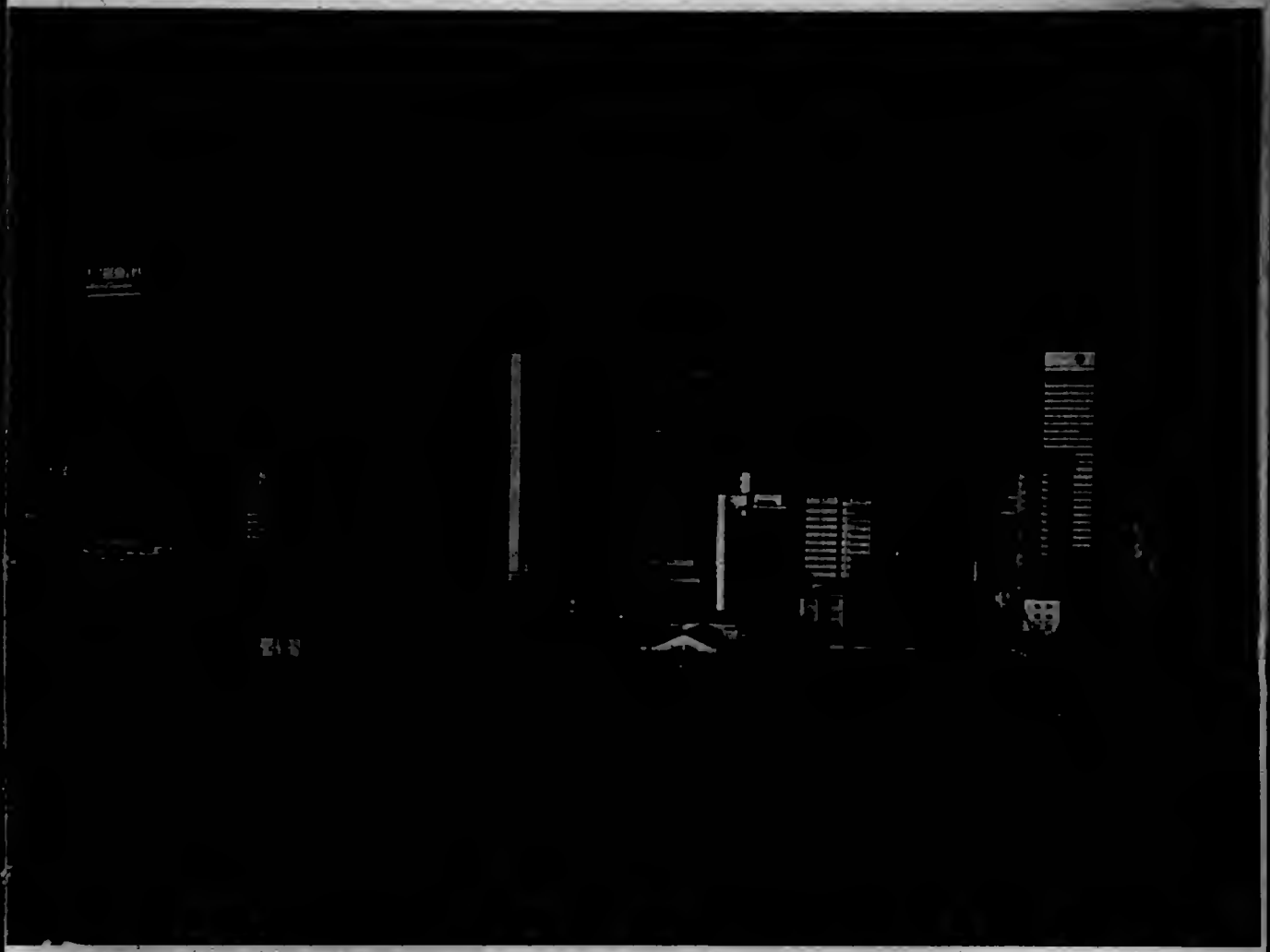
New Companies

United States Computer Corp. has been formed to develop and market new hardware and software products. It will specialize in library and security systems and offer general consulting services. The address of the new compnay is P.O. Box 13363A, Orlando, Fla. 32809.

Nova Software, Inc. is a third-party software house located at Suite 104, 3375 South Bannock, Englewood, Colo. 80110. Areas of specialization include manufacturing systems, IBM Mapics, general accounting, oil and gas accounting, property management, moving and storage, medical systems, auto fleet management and data communications.

MPS Systems Consulting Group offers custom-programming software packages and computer security analysis. It is located at 7022 Sunset Blvd., Los Angeles, Calif. 90028.



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NCB is now embarking on a massive programme to develop and implement state-of-the-art computer-based information systems for its Civil Service, and is entrusted with the responsibility of purchasing computer products and services. The NCB does not intend to reinvent the wheel. Where possible, software packages will be acquired, and if necessary, modified to suit its needs.

Application systems are required in health care, library management, education, finance, law enforcement, land utilization, personnel system, communication and others. Software packages will be needed for data base/data communication, decision support graphics, text processing, simulation, weather forecasting, and other specialised applications like computer-aided despatch systems.

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In your submission, please include a brief description of your company, the number of installations using the proposed software, cost implication, if possible, and whether support is available in Singapore.

Record Earnings of $2.1 Million Reported by IPL Systems for 1981

WALTHAM, Mass. — IPL Systems, Inc. has reported record 1981 revenues of $17 million and record earnings of $2.1 million for the year ending Dec. 31.

These results represent 36% and 75% increases, respectively, over last year's $12.5 million revenues and $1.2 million earnings. Earnings per share of 45 cents for 1981 were 50% higher than the 30 cents recorded in 1980.

Earnings and per-share figures for 1980 do not reflect the effect of an extraordinary gain from the exchange of a nonmonetary asset in April 1980, a spokesman said.

The fourth quarter represents IPL's 18th consecutive quarter of profitability. Revenues amounted to $4.9 million, an increase of 58% over the $3.1 million recorded in the fourth quarter of 1980. Earnings totaled $454,000, 63% higher than the $278,000 recorded in the year-ago quarter, the spokesman said.

Nickels & Dimes

Business Development Partners has made an initial investment of $500,000 in Micro Peripherals, Inc.

$$$

Intel Corp. plans to raise $40 million through an industrial revenue bond offering issued by the Puerto Rico Industrial, Medical and Environmental Pollution Control Facilities Financing Authority. The funds will then be used to finance the company's expansion in Puerto Rico.

Micro-Z Corp. has filed a registration statement with the Securities and Exchange Commission covering a proposed public offering of one million shares of its common stock.

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Gandalf Data, Inc. reports that its shares will now be listed for trading on the Toronto Stock Exchange, with a trading symbol of GAN.

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FACT

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Systems Analysts

We need a systems analyst with a minimum of 2 years' experience in systems or applications areas. Experience with SAS/PL1 desired. Analyst must be adept at detailed problem solving. Familiarity with MICS (MVS integrated control system) a definite plus. Area of responsibility will include performance analysis and capacity planning.

In addition, a senior systems analyst is needed for a supervisory position. You must have at least 7 years' experience, with 4 years in PL1, IMS, DB/DC, OS utilities and TSO. MARK IV/SAS is a plus.

A systems analyst is also needed to work on Aramco's oil tracking system. You must have Fortran experience on a CHI 2130 or IBM 1130 in a time-sharing environment. Commercial applications desirable.

Supervisory Data Examiner

You'll coordinate work flow between data entry, computer operations, and client organization throughout the company, both in Saudi Arabia and Houston. This position involves rotating shift work and the supervision of 15 to 20 employees. You must have a thorough knowledge of data processing work flow and the ability to optimize operations when necessary. You must have proficiency in IBM JCL, TSO, and a familiarity with OS/MVS, JES2.

Required is an associate degree and at least 5 years' experience in data processing.

Data Base Analysts and Support Analysts

You must have a minimum of 2 years' experience in IMS system support including use of BTS, IMS utilities, DB performance and tuning tools—IMSPARS, IMSASAP, DB and DC monitors, etc.

Commercial Programmers

Your primary duties will include development and maintenance of software to support purchasing, shipping and financial activities of the company.

Required is 2 years of DP experience; PL1, OS/MVS, JES2, structured techniques experience; and experience with projects involving treasury, industrial relations, and payroll.

We also need Commercial Programmers with 3 years' experience and familiarity with PL1, TSO, IMS, DB/DC, OS utilities, and MARK IV/SAS.

Commercial Analyst/Programmers

You must have at least 3 years' experience in design, analysis and programming of commercial application systems, and at least 2 years' experience in IMS on-line DB/DC and PL1. ADF or MARK IV experience is required as well.

Standards and Procedures Analyst

You must have at least 3 years' experience in data processing including systems analysis and technical writing. Experience with IBM TSO/SPF and SCRIPT/VS is necessary. Candidate will conduct search and analysis to insure quality and consistency of documentation and assist project teams in developing standard procedures and guidelines. Individual may also interface with user groups in a quality assurance role.

Accounting Staff Analyst

A systems analyst is needed with 4 years' experience in data processing, of which 2 years should be in a staff function. Candidate will prepare business plans, budgets, and monthly accruals. Vendor interface and cost justification of hardware will be a large part of the job.

Shift Coordinator

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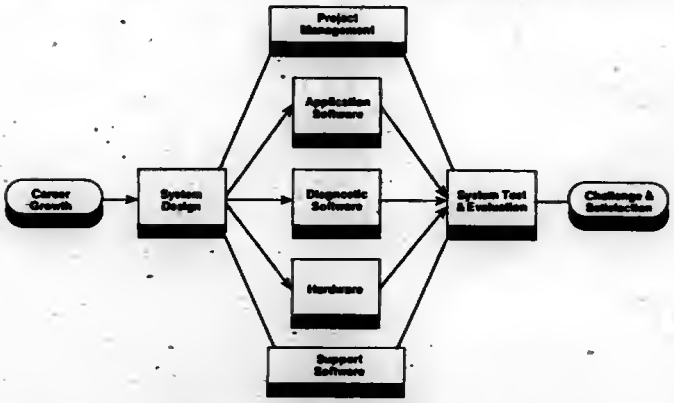

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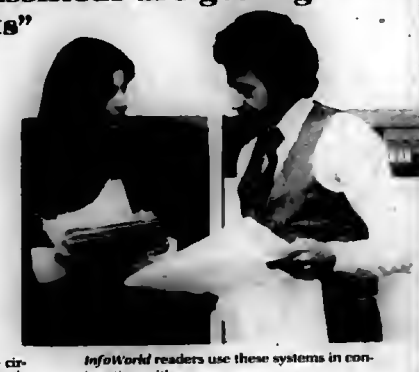

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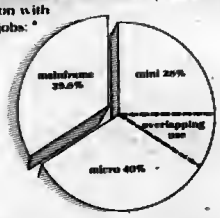

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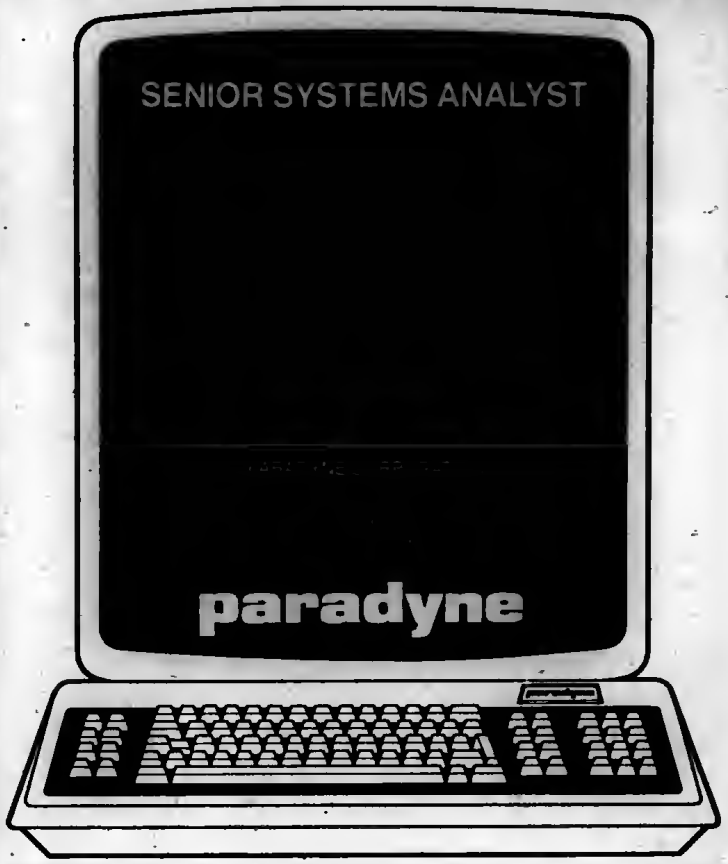

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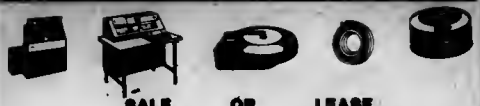

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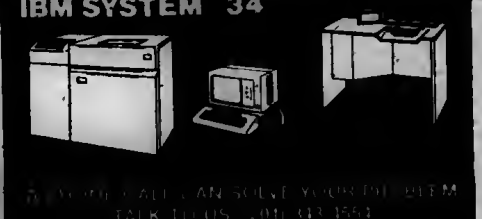

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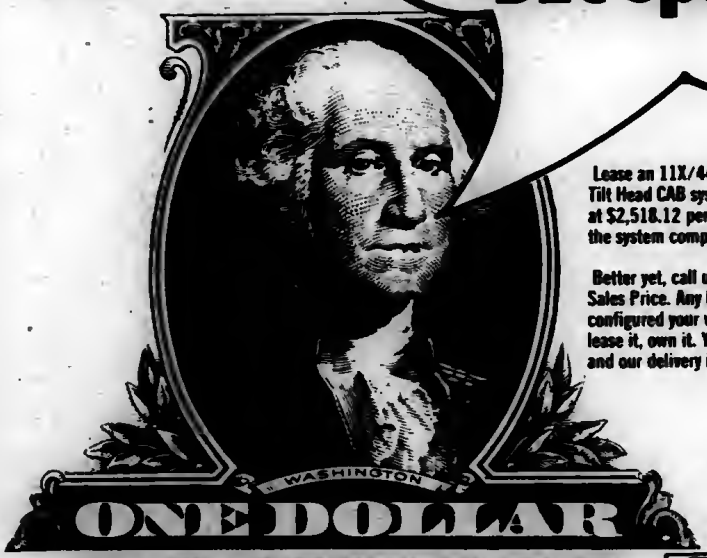

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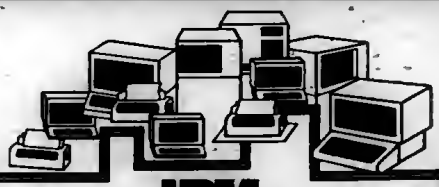

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Bulletin Board ads come in standard units (one column wide by one inch deep) and standard typefaces. (Units may be combined to produce deeper ads, but one column is maximum width and no units of less than one inch are available.) Ads are arranged under headings (such as "IBM", "DEC" or "Software") and within headings, if necessary, by type of equipment. The first line of the ad is set in larger, bold type, and should be the standard equipment identification (such as "IBM S370/Mod 40"). (Headlines may be put on more than one line, if desired.) The body copy should describe the equipment very briefly, give the price and the person to contact. This is all the information an interested buyer needs to follow up. No ad should have more than one piece of equipment or software.

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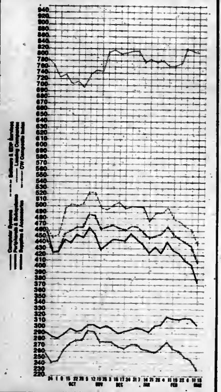

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CLOSING PRICES WEDNESDAY, MARCH 10, 1982

EXCH		PRICE 1981-82 RANGE (1)	CLOSE MAR 10 1982	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
A	AMDAHL CORP	21- 48	22 5/8	-3 5/8	-12.8
N	BURROUGHS CORP	29- 72	34 7/8	-1 3/4	-4.7
O	COMPUTER AUTOMATION	8- 28	8	-4	-30.7
N	CONTROL DATA CORP	18- 42	32	-3 3/4	-7.8
O	CRAY RESEARCH INC	25- 48	27 1/4	-4 3/4	-14.8
N	DATA GENERAL CORP	27- 67	29 1/2	-14 1/4	-32.8
N	DATAPOINT CORP	21- 68	21 1/4	-5 1/4	-18.8
N	DIGITAL EQUIPMENT	74-113	74 3/4	-7 1/2	-8.1
N	ECCO INC	8- 18	8 3/4	- 1/8	-1.8
N	ELECTRONIC ASSOC.	5- 12	6 7/8	- 3/8	-5.1
N	FOUR-PHASE SYSTEMS	18- 48	41 3/4	0	0.0
N	FOXBORO	42- 83	88	-1 1/8	-2.4
O	FULCRUM CORP GRP	1- 3	2/8	0	0.0
O	GENERAL AUTOMATION	3- 18	2 2/8	-1 1/8	-30.7
N	HARRIS CORP	28- 80	28 1/8	+1 1/8	+4.0
N	HEWLETT-PACKARD CO	33- 54	37 3/8	-2 7/8	-8.3
N	HONEYWELL INC	65-118	70 5/8	-6	-8.8
N	IBM	48- 73	58	- 7/8	-1.4
O	IPL SYSTEMS INC	7- 12	7 1/4	+ 3/4	+11.8
O	MAGNUSON COMP SYSTM	8- 32	2	- 3/8	-11.1
O	MANAGEMENT ASSIST	8- 28	8 1/8	-1	-8.8
O	MINI-COMPUTER SYST	8- 4	3/8	+ 1/8	+25.0
N	MODULAR COMPUTER SYS	7- 32	8 3/4	- 1/8	-1.8
N	MOHAWK DATA SCI	10- 32	10 3/8	-1 3/8	-11.7
N	NCR	38- 78	41 7/8	-2 7/8	-6.4
N	PRIME COMPUTER INC	17- 48	18 7/8	-3 1/8	-14.2
N	PERKIN-ELMER	18- 38	18 3/4	-1 5/8	-7.8
N	SPERRY CORP	28- 85	28	-1 3/8	-4.6
O	TANDEM COMPUTERS INC	13- 38	23 1/4	-1 1/8	-6.0
N	TEXAS INSTRUMENTS	71-151	78 1/4	-4 3/8	-5.2
A	WANG LABS.	22- 48	23 7/8	-1 1/4	-4.8
	LEASING COMPANIES				
O	BROTHER FINANCIAL CP	18- 28	23	0	0.0
N	COMDISCO INC	18- 27	22	-3 1/8	-12.4
O	COMMERCE GROUP CORP	1- 2	1/2	0	0.0
O	COMPUTER INVESTRS GRP	1- 4	1/4	0	0.0
O	CONTINENTAL INFO SYS	4- 8	6 1/8	+ 3/8	+7.3
N	DPF INC	5- 12	8 1/4	-1 1/8	-10.8
N	ITEL	1- 15	1 1/4	+ 1/8	+11.1
O	LEASPAC CORP	1- 8	1/8	0	0.0
N	U.S. LEASING	18- 30	23 3/8	- 1/4	-1.0

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EXCH		PRICE 1981-82 RANGE (1)	CLOSE MAR 10 1982	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	2- 8	3	0	0.0
O	ADVANCED SYSTEMS INC	10- 17	13	- 1/8	-3.7
O	ANACOMP INC	10- 18	11	- 3/4	-6.3
O	ANALYSTS INTL CORP	3- 14	7 1/4	0	0.0
O	APPLIED DATA RES.	13- 23	18 7/8	-2 1/4	-10.0
P	ARTRAPYNE CORP IND	2- 5	3 1/4	- 3/8	-14.2
N	AUTOMATIC DATA PROC	22- 32	29	- 1/4	-6.8
O	CGA COMPUTER ASSOC	8- 25	8 1/4	0	0.0
O	COMPUTER HORIZONS	1- 5	5	0	0.0
O	COMPUTER NETWORK	8- 8	8 3/4	- 1/4	-6.8
N	COMPUTER SCIENCES	12- 8A	12 7/8	- 7/8	-6.3
O	COMPUTER TASK GROUP	10- 23	10	- 1/4	-2.4
O	COMPUTER USAGE	2- 10	2 7/8	- 1/8	-4.1
O	COMSHARE CORP	8- 18	11 3/4	-1 1/2	-11.2
O	COMSHARE	7- 21	8 7/8	- 1/4	-2.8
O	CULLINANE DATABASE	15- 37	24 3/4	+1 1/4	+5.2
O	DATA DIMENSIONS INC	0- 4	3/8	-	-14.0
O	DATATAB	1- 4	1	- 3/8	-27.2
O	DBI CORP	4- 8	4 1/2	-1 1/8	-20.0
O	DYATRON CORP	3- 11	3 1/4	0	0.0
N	ELECTRONIC DATA SYST	15- 30	18 3/4	- 1/8	-2.4
O	INFORMATICS INC	10- 23	14 1/4	- 1/2	-3.2
O	INTRYTE CORP	1- 8	1 3/4	0	0.0
O	IPS COMPUTER MARKET.	1- 4	1 1/8	0	0.0
O	KEANE ASSOCIATES	4- 8	4	0	0.0
O	LOGICON	12- 28	12 1/2	-10	-50.1
O	MGMT SCI AMER INC	17- 28	17 3/4	- 3/4	-4.0
O	MATHEMATICA INC	12- 28	21	-3	-10.2
O	MATHEMATICAL APP GRP	14- 28	14	-1	-6.8
O	NATIONAL DATA CORP	14- 28	14 1/2	- 7/8	-5.8
O	PLANNING RESEARCH	8- 12	8	- 3/8	-6.4
O	PROGRAMMING & SYS	1- 2	1 3/8	+ 3/8	+40.0
O	REYNOLDS & REYNOLDS	18- 28	20	+1 1/4	+6.0
O	SEI CORP	17- 23	23	-1 3/4	-7.0
O	STSC INC	8- 28	8	- 1/2	-7.0
O	SCIENTIFIC COMPUTERS	8- 18	8 1/4	- 3/4	-10.7
O	SOFTWARE AG	8- 23	7 2/4	- 1/4	-3.1
N	TYMSHARE INC	16- 38	17 5/8	- 5/8	-2.4
O	URS CORP	11- 18	11	-1	-8.3
O	WYLY CORP	7- 20	7 5/8	- 3/8	-4.8
	PERIPHERALS & SUBSYSTEMS				
N	AM INTERNATIONAL	2- 28	2 1/8	+ 5/8	+41.0
A	ANDERSON JACOBSON	10- 26	10 1/4	-1	-8.8
O	AUTO-TROL TECHNOLOGY	8- 67	8 1/2	-1 3/4	-17.0
O	BARRY'S INC	10- 39	18	-11 1/4	-38.4
N	BEEHIVE INTL	8- 18	5 3/4	+ 1/4	+3.0
A	BOLT,BERANEK & NEW	8- 23	10 1/8	-1 1/4	-8.8
O	CAMBEX CORP	2- 8	2	0	0.0
O	CENTRONICS DATA CORP	7- 40	8 1/2	-1 1/8	-10.0
A	CPT CORP	4- 8	6	- 3/8	-6.8
O	COMPUTER DEVICES INC	4- 10	8	- 3/8	-6.0
O	COGNITRONICS	2- 11	2 2/8	- 1/2	-17.2
O	COMPUTER COMMUN.	1- 2	1/2	- 1/4	-33.2
O	COMPUTER CONSOLES	18- 8A	17 3/4	-1 1/2	-7.7
N	COMPUTER TRANSCEIVER	3- 8	6 1/8	- 1/8	-2.0
N	COMPUTERVISION CORP	20- 48	24 7/8	- 3/4	-3.0
N	COMPAC CORP	17- 28	22 1/2	- 3/8	-1.8
A	DATA ACCESS SYSTEMS	2- 23	3 1/8	+ 3/8	+10.8
A	DATAPRODUCTS CORP	17- 44	17 3/4	-1 3/8	-7.1
O	DATUM INC	2- 8	1 1/2	- 1/8	-7.5
O	DAVID JAMISON CARLYL	3- 7	4 3/4	- 1/2	-9.3
O	DECISION DATA COMPUT	3- 8	2	0	0.0
O	DELTA DATA SYSTEMS	2- 4	1 3/4	0	0.0
O	DATARAM CORP	4- 18	5	- 5/8	-11.1
N	ELECTRONIC M & R	8- 8	2 1/4	+ 1/8	+4.0
O	EVANS & SUTHERLAND	18- 40	18 3/4	-1 1/8	-7.8
O	GENERAL COMPUTER SYS	1- 32	4 1/2	-1	-18.1
N	GEN'L DATA COMM IND	7- 18	7 1/4	+ 1/8	+1.7
O	GENERAL TERMINAL CP	1- 4	1/2	0	0.0
N	HAZELTINE CORP	18- 35	28	-1 5/8	-6.4
O	INFORMATION INTL INC	8- 17	10 1/2	-1	-8.8
O	INTEL CORP	21- 51	24 3/4	-1	-2.8
O	IPL SYSTEMS INC	8- 18	4 7/8	-1 5/8	-25.0
A	LUNDY ELECTRONICS	7- 18	7 7/8	0	0.0
A	MAI DATA CORP	12- 37	18 7/8	- 1/8	-0.7
O	NETWORK SYSTEMS CORP	14- 27	15 7/8	-1 1/8	-6.8
O	ONEX	2- 12	8	0	0.0
N	PARADYNE CORP	23- 52	8A 7/8	-1 3/8	-5.8
A	PERTEC CORP	8- 17	7 5/8	- 1/4	-3.1
O	QANTEX CORP	8- 23	12 3/8	-2 1/8	-14.8
O	RECOGNITION EQUIP	4- 31	4 3/4	+ 1/8	+2.7
O	SCAN DATA	1- 8	3/4	0	0.0
N	STORAGE TECHNOLOGY	18- 48	23 7/8	-3 3/8	-8.4
O	SYKES DATATRONICS	8- 34	25 1/8	-1 3/4	-7.0
A	T BAR INC	12- 18	13 1/2	-1 3/8	-10.7
O	TEC INC	4- 7	8 3/4	- 1/2	-8.0
N	TEKTRONIX INC	43- 70	43 1/4	-4 1/8	-8.4
N	TELEX	5- 8	7	- 3/8	-5.0
O	TESDATA SYSTEMS CP	8- 17	8 1/8	-1	-10.5
O	TIMEPLEX INC	7- 18	7	-1 1/4	-15.1
O	WILTEK INC	1- 2	1 1/2	- 3/8	-20.0
	SUPPLIES & ACCESSORIES				
N	AMERICAN BUS PRODS	11- 12	11 5/8	- 1/8	-4.1
O	BALTIMORE BUS FORMS	1- 2	1 1/4	0	0.0
N	BARRY WRIGHT	10- 24	16 1/8	-1 3/8	-7.8
O	CYBERMATICS INC	1- 2	1	-	-5.0
O	DUPLEX PRODUCTS INC	12 17	13 1/4	- 1/4	-1.8
N	ENNIS BUS. FORMS	18- 23	17	+ 1/4	+1.4
N	3M COMPANY	48- 65	51 5/8	-2 3/8	-4.1
O	MOORE CORP LTD	27- 38	31 1/2	0	0.0
N	NASHUA CORP	18- 33	18 1/2	- 3/8	-2.2
O	STANDARD REGISTER	30- 41	36	0	0.0
A	TAB PRODUCTS CO	15- 30	14 1/2	- 7/8	-5.8
N	WALLACE BUS FORMS	22- 30	29 1/8	-3 3/8	-10.8

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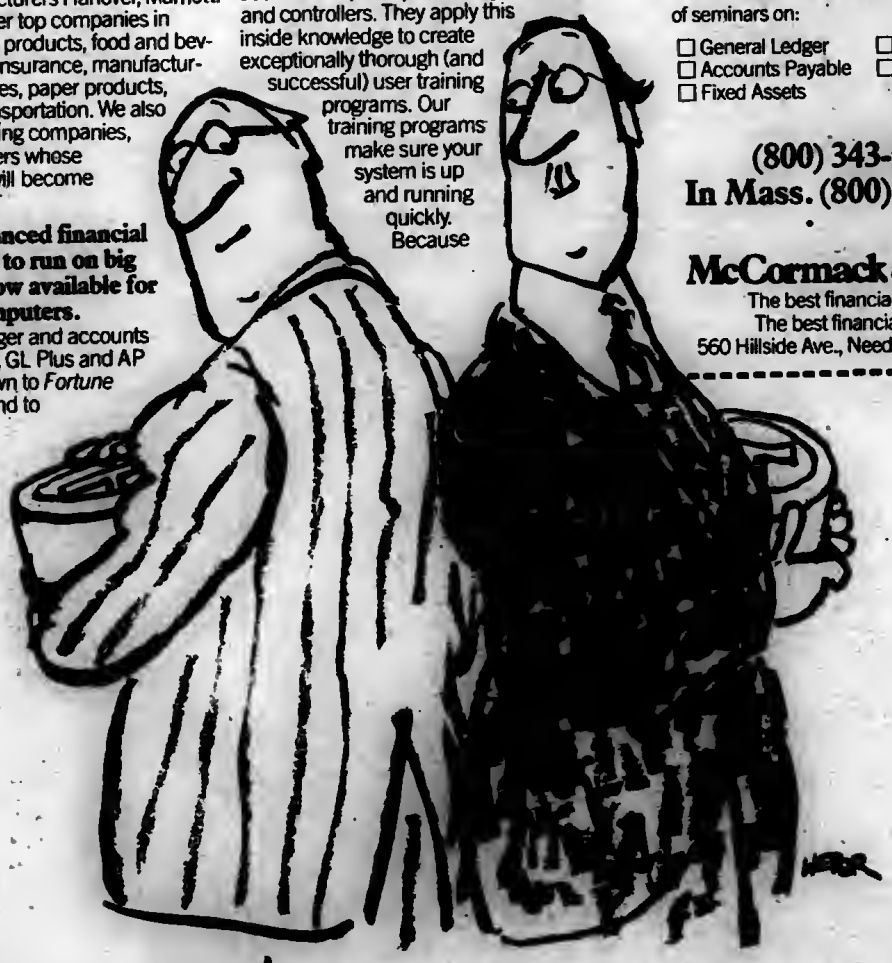
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